The Mining Journal

Established 1835 — Railway & Commercial Gazette

Vol. CCXLVI No. 6304 — LONDON, JUNE 15, 1956 — PRICE 9d.

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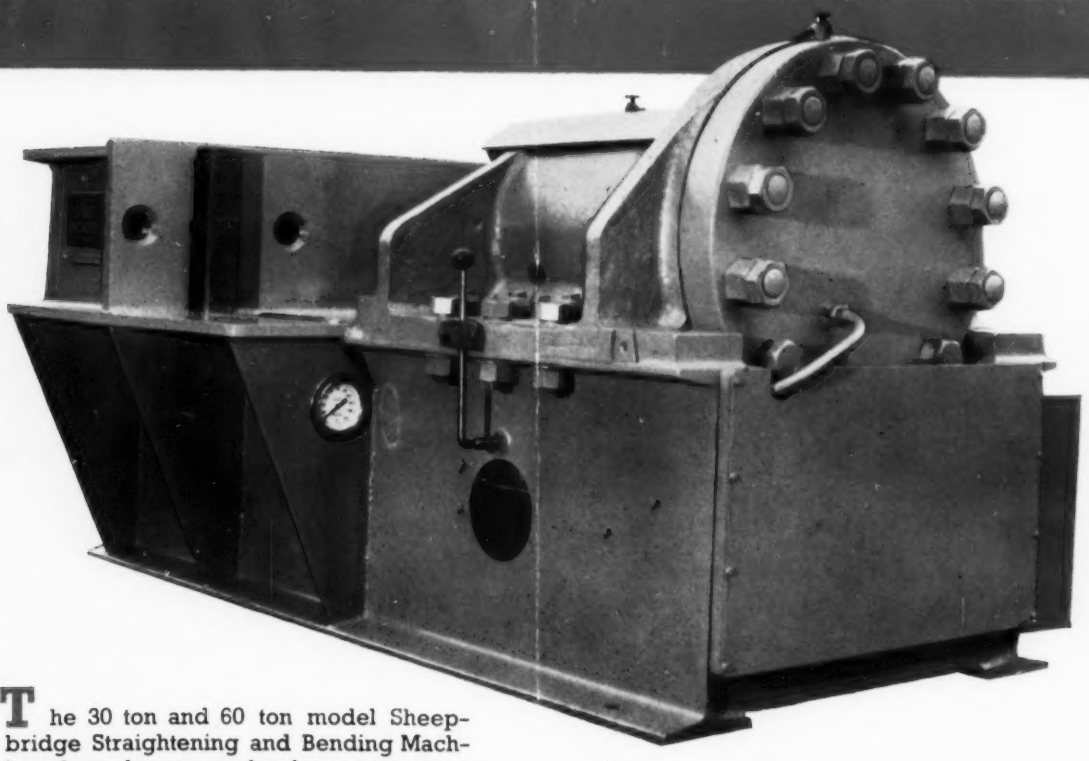

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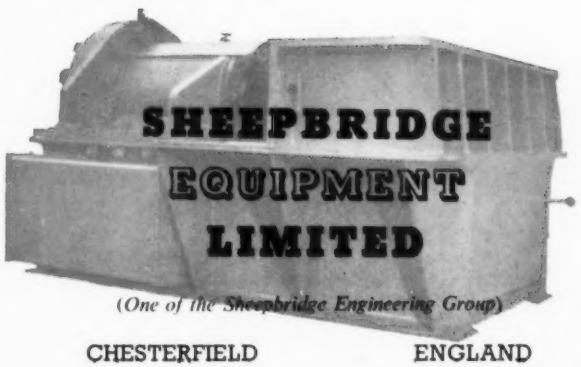

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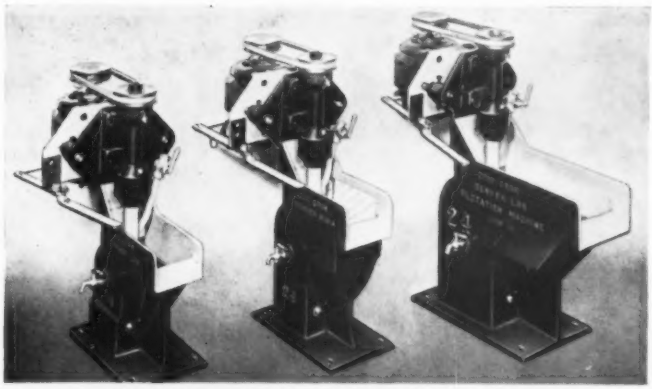

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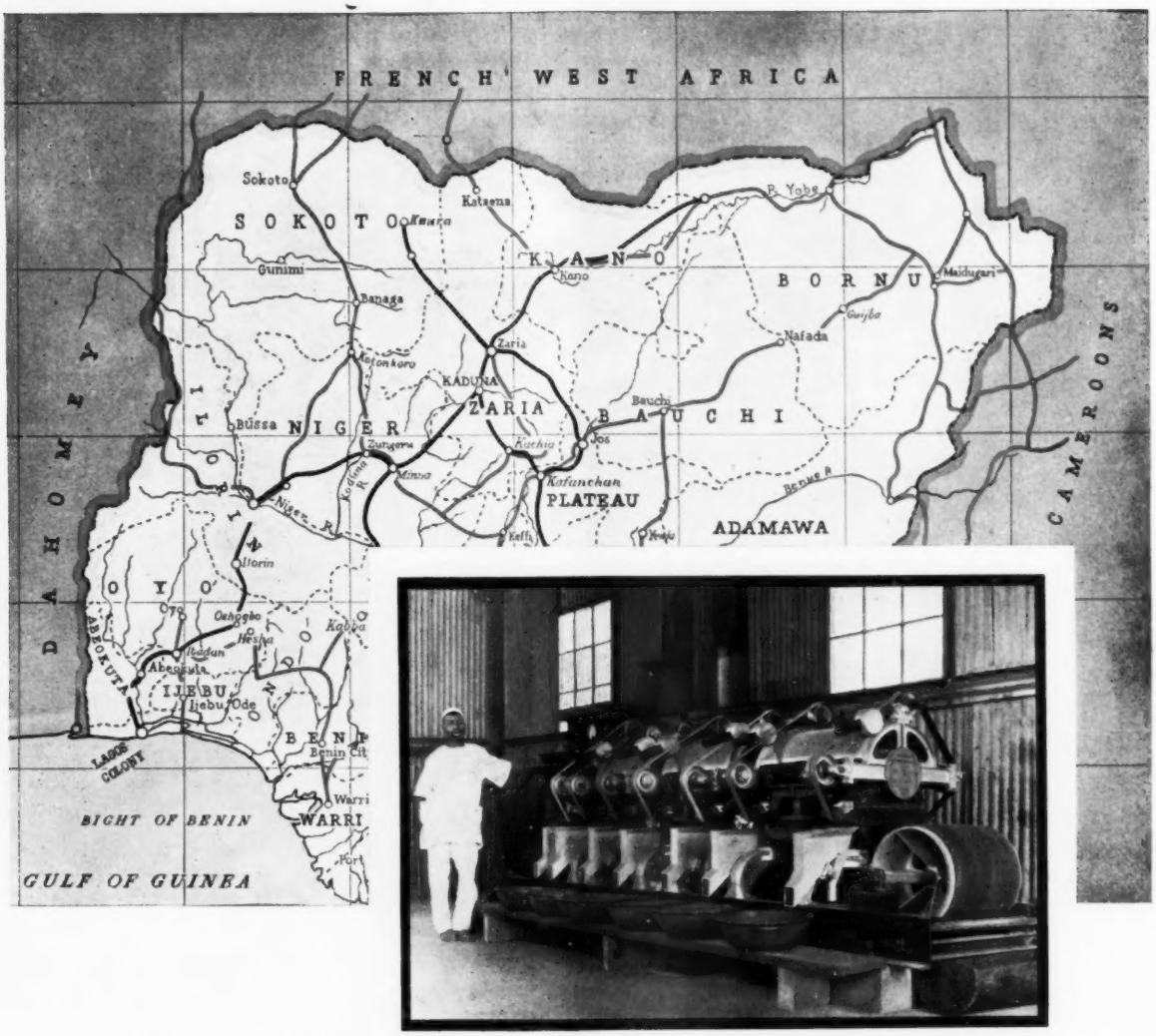
Magnetic separation of columbite in NIGERIA



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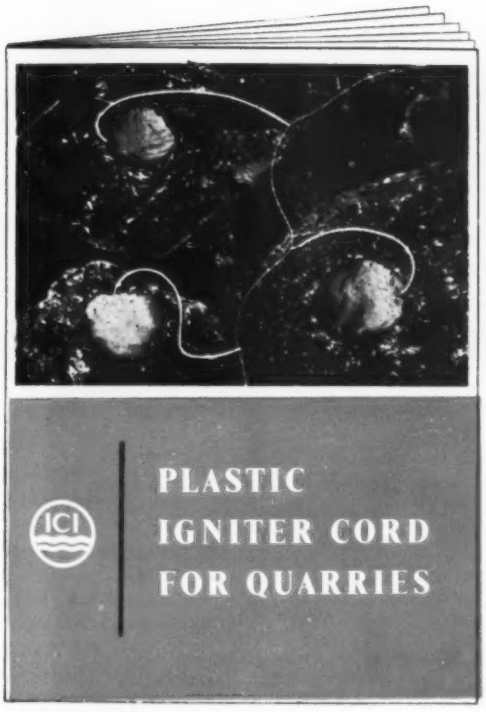

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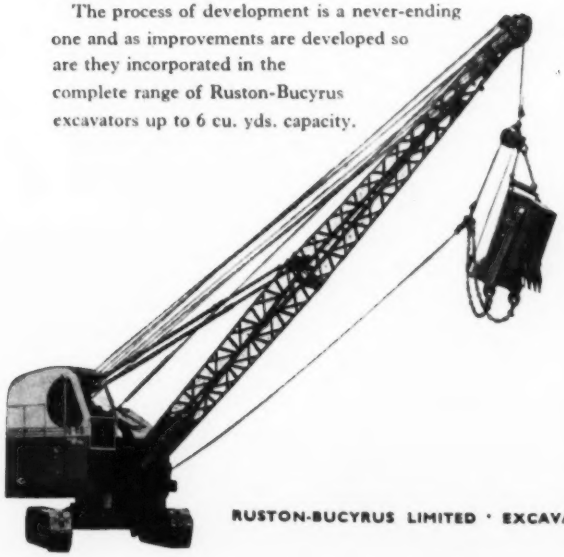

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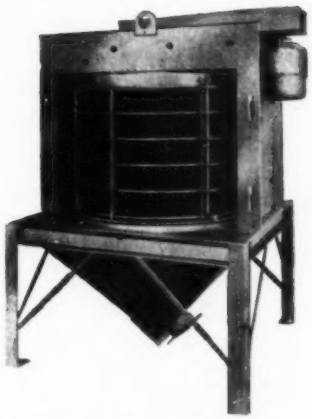

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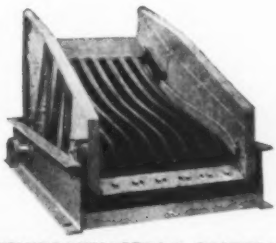

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Established 1835

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NOTES AND COMMENTS

The Future of Tinplate Containers

The American Can Company has announced the development of a new process for soldering cans which, it is claimed, promises to take 98 per cent of the tin out of more than 10,000,000,000 cans, resulting in an aggregate saving of up to 2,630 tons of tin a year, out of a total U.S. consumption of tin in tinplate which amounted last year to 33,400 tons. Coffee and pet food cans are already being made by the new process, which, it is expected, will also be used for beer cans.

Having regard to the critical dependence of the U.S. on overseas sources for supplies of tin, it is understandable that the development of "tinless cans" should be accorded a high priority in the research programmes of the American tinplate industry. European manufacturers have also taken some interest in the "tinless can," but for a different reason, namely the possibility of reducing container costs. In this connection, however, it is pertinent to point out that the cost of a tinplate container depends far more on the price of steel than on that of tin.

Forty per cent of all tin consumption is used in tinplate manufacture and the U.S. is by far the largest producer and consumer of tinplate. It is evident, therefore, that the tin mining industry would be seriously affected by the elimination of tin from a high percentage of the metal cans produced in the U.S. during the next decade. However, examination of the available evidence suggests that, notwithstanding recent claims by American research workers, tin producers are unlikely to be put out of business by the "tinless can". Despite the possibility of increasing competition from other materials, the expanding demand resulting from population growth and rising living standards should be sufficient to maintain the upward trend both in tinplate production and in the overall consumption of tin by this major industry.

Statistics prepared by the International Tin Study Group indicate that since 1943 the free world consumption of tinplate has more than trebled, while the total quantity of tin used in the manufacture of tinplate has almost doubled. It is noteworthy that in 1941, 68,500 l.tons of tin were used in the production of 4,275,000 tons of tinplate, whereas 7,177,000 tons of tinplate produced last year required only 62,700 tons of tin. The use of lighter coatings has not resulted from any lowering of container performance standards, but has come about because research has developed methods to make a given amount of tin serve more effectively, mainly through the use of electrolytic methods in place of hot dipping.

Tin has properties which render it outstanding as a protective coating for steel containers. For strategic or economic reasons, however, consideration has been given to a number of possible replacements, including chemically treated steel, aluminium, steel coated with aluminium, other types of alloy coatings and also plastics.

The mechanical properties of plain steelplate are essentially the same as those of tinplate, but a difficult problem is presented by the rusting of this material when not protected. Some success is reported from the use of rust-resistant chemically treated steel, which, however, has the disadvantage of being harder to solder than tinplate or plain steelplate.

Aluminium, though it has gained a small footing in the container field—notably in Scandinavia, Britain and certain European countries—does not so far constitute a serious threat to tin. Aluminium foil has lately found an expanding outlet as a packaging material for frozen foods, notably in the U.S. Aluminium coatings on steel are also under investigation. In November an "entirely tinless food can" made of this material was exhibited in the U.S. Among other materials which have been considered as protective coatings for steel are zinc, nickel, cadmium and even titanium.

Discussing possible developments which might affect the consumption of tinplate, Dr. W. E. Hoare, assistant director of the Tin Research Institute, stated recently that aluminium could not be regarded as a serious competitor, and that although aluminium-coated steel might compete economically in the gauges and coating thicknesses which would enable it to do so, the materials existed at present rather as a laboratory experiment. He saw little reason for expecting the lacquered steel can to become a serious competitor of the tinplate container. Food and beverage packing, which constitutes more than 95 per cent of the tinplate container market, has so far remained outside the

ambit of the steel can, the reason being that even with a coating thickness of a fraction of a micron, tinplate still has virtues which place it in an entirely different field from uncoated steel. A few years ago it was thought that deep-frozen products might mean a substantial loss to canning and tinplate, but the composite frozen-food package is, in fact, providing quite a good extra market for tinplate.

Dr. Hoare is of the opinion that in the next 15 years small inroads into the tinplate container field may be made by aluminium and by lacquered steel. These would occur in some of the less-critical, non-food applications and would not exceed 5 per cent of present consumption. Such inroads would be vastly more than counterbalanced by new and expanded uses.

Of the 62,700 l.tons of tin consumed by the free world in tinplate during 1955, 9,800 tons were consumed in the U.K. and 33,400 tons by the U.S. Forecasts taking into account all known factors likely to influence future demand indicate that by 1960 the quantity of tin consumed in tinplate may well have risen to 70,000 l.tons, of which the U.S.—despite the introduction of "tinless cans"—will account for 36,000 tons and the U.K. for 12,500 tons.

World tinplate production in 1955 amounted to almost 7,200,000 l.tons. It is estimated that by 1960 it will be in the region of 8,750,000 tons annually. Production of electrolytic tinplate will undoubtedly increase and it is for this reason that the estimated increase for the consumption of tin in tinplate is only about 11-12 per cent, whereas that for tinplate is about 22 per cent.

In this connection it is of interest that in 1955, 80 per cent of the U.S. output of tinplate was already electrolytic. Thus there can no longer be much scope in the U.S. for further conservation of tin through transfer to electrolytic methods. In other parts of the world, however, economy through switching over from hot dipped, has still a long way to go. In the U.K., for example, 70 per cent of the tinplate production is hot dipped and in France the proportion is well over 80 per cent.

Rights to Work Minerals

In a memorandum submitted to the Ministry of Fuel and Power, the Federation of British Industries states that the nation's mineral wealth is not being fully exploited. In the Federation's opinion this is because the Act governing the compulsory grant of working facilities—the Mines (Working Facilities and Support) Act 1923—is too limited in its application.

The position, broadly speaking, is that under the 1923 Act only persons having an interest in the minerals may be granted the right to work them. Exemption from this requirement of prior interest has been accorded to coal under Section 13 of the Mining Industry Act 1926 and to a further group of "privileged minerals" under the Mines (Working Facilities) Act 1934. The latter group includes fluorspar, barytes, ironstone and, in fact, virtually all the minerals with which readers of this journal are likely to be primarily concerned. There remain a number of materials of industrial importance, such as fireclay, limestone, sand and ballast, which are subject to the limitations imposed by the 1923 Act.

The situation, briefly, is that, in the case of privileged minerals, where agreement cannot be reached with the owner of the rights by private negotiation, application can be made for the compulsory grant of working facilities. Where non-privileged minerals are concerned, however, application for working rights cannot be granted until an interest in the minerals has been acquired.

The F.B.I. is urging the Minister to amend the law so as to enable any mineral undertaker to apply for the right to exploit minerals which, in the national interest, and subject to planning control, might properly be worked on payment of a fair price or royalty in respect of the right granted.

Much consideration has also been given to the nature and composition of the Tribunal which should be charged with the responsibility for deciding such issues as the grant of working facilities. Experience in matters of procedure since the functions of the Railway and Canal Commission were transferred to the High Court in 1949 has led to the conviction that the High Court is not the most suitable tribunal to determine the many technical issues involved in such applications. The F.B.I. would accordingly welcome the re-establishment of the Railway and Canal Commission or, alternatively, the transfer of the High Court's functions to some other tribunal such as the Lands Tribunal, provided a simple procedure was adopted.

Of direct concern to the metal mining industry are the Federation's recommendations in regard to the process of securing mineral rights, since they relate to applications in respect of minerals both privileged and otherwise. We cannot, however, recall any instance where difficulties have been experienced by undertakers seeking to exploit metalliferous deposits. It is doubtless for this reason that, so far as we are aware, this particular issue has not been taken up by the United Kingdom Metal Association, which, we understand, is not associated with the Federation in the representations which are currently being made.

Canada's Programme of Mining Expansion

The growth of the Canadian mining industry continues to gather momentum. In 1956, the industry has plans for new capital outlays of $97,000,000 on machinery and equipment and $125,000,000 on construction, as compared with $57,000,000 and $77,000,000 respectively in 1955. The most spectacular new developments are in uranium and iron ore. In uranium, Gunnar Mines in the Beaver Lodge area and the Pronto Uranium Mines in the Ontario Blind River district went into production in 1955; these companies, with others in the same areas and in the Bancroft (Ontario) district which are not yet in production, have contracts with the Federal Government for the delivery of uranium concentrates to the value of $693,000,000 by 1962. At the time of peak deliveries the annual value of uranium production will be about $250,000,000.

In iron ore development the main emphasis is on "concentrating" ores: $16,000,000 is being spent to re-open old workings in Pontiac, Quebec, for the production of 500,000 tons of pellets annually; and a $30,000,000 plant is being designed for Iron Bay Mines in north-west Ontario to produce 4,000,000 tons annually of Bessemer grade pellets. The Newfoundland Government has guaranteed a loan to assist the development of the very rich iron ore deposits at Wabush Lake in coastal Labrador, while one of the leading U.S. steel producers is drilling in the Mount Wright area some 200 miles north of Seven Islands, Quebec: plans are also in train to develop large deposits in the sub-arctic area between Hudson Strait and Umgava Bay. New mining developments also include the newer metals such as lithium and columbium and the broad range of non-ferrous metals; they extend outside the developed mining areas of Quebec and Ontario to northern Saskatchewan and to New Brunswick in the east.

From information which has appeared in *The Mining Journal* from time to time, it is evident that the current year will be yet another milestone in the spectacular development of the aluminium industry. As previously reported, the Canadian British Aluminium Company expects to start construction this year of its smelter at Baie Comeau, Quebec; the first of two potlines should be in operation by

November, 1957; in all, eight potlines of 2,000 ft. with an annual capacity of 160,000 tons of aluminium are proposed. On the west coast, Alcan proposes to add 60,000 tons of smelting capacity annually until 1959 to its plant at Kitimat at a total cost of about $190,000,000. In Quebec, 22,000 tons of capacity will be added to the Isle Maligne plant during 1956 at a cost of $15,000,000.

Shortages of steel, cement and other materials noticeably hampered construction in 1955 and the four primary producers are extending the expansion programmes started from 1952 onwards. The production of cement also continues to expand. New projects announced in the second half of 1955 are expected to ad ' 12,500,000 bbl., or the equivalent of almost half the 1955 production. Between 3,000,000 and 4,000,000 bbl. of this additional capacity should be in operation by the end of 1956 and most of the balance during 1957.

The Canadian Government's survey of investment plans for 1956 found that the capital outlays planned would place a considerable strain on the available supplies of labour, materials and investment funds. The operations of the Bank of Canada have accordingly been directed increasingly towards moderating the rates of expansion in the use of bank credit.

Australia

(From Our Own Correspondent)

Melbourne, May 31.

Australian production of copper has now exceeded 40,000 tons, mainly through increased output by Mount Isa Mines, Queensland. Recent developments there, and at the Peko Mine, Tennants Creek, Northern Territory, indicate that production is likely to increase still further in the near future, and that the country may move from a net importer to a net exporter of copper.

The matter of protection for the industry has been under consideration by the Tariff Board, which made recommendations in its recent report to Government. The main recommendations were : that the export control on copper be abolished; that there should be duty-free entry for imported blister copper; and that there should be a tariff on imported refined copper of £A4 per ton, subject to review after two years. These recommendations were rejected by the Government. In the event of a considerable decrease in the price of imported copper the question of assistance to the industry will be referred to the Tariff Board.

ANTI-INFLATION AND GOLD MINING

It is thought that with lower prices for primary products and a decline in the rate of industrial expansion, the gold mining industry may again become a valuable source of employment and national wealth. If anti-inflationary measures are successful, reduction in costs may follow, to the general benefit of operations.

The assistance given by the Commonwealth Government in the past three years has been very helpful, but falls short of that afforded the industry in Canada, with the result that the industry in that Dominion is much more flourishing than in Australia, where there has been little official recognition of the national value of the industry, although gold has made a substantial addition to the dollar pool in recent years. Most of the producing mines have been in operation for upwards of 60 years, and have many years' life ahead, unless forced to close down because of rising costs and a fixed, and inadequate, price for gold. There are old and idle goldfields in this country that hold legitimate prospects for deeper, and also lateral, exploration, but there is little or no incentive for the investment of capital, and the attendant risks, while the cost and the market position remain as they are.

BONUS PAYMENTS

The question of incentive and bonus payments to employees has a number of contentious features. In the case of lead producing companies, such as the Broken Hill mining companies, Mount Isa Mines, and the Broken Hill Associated Smelters, such payments are not of an incentive nature, being based entirely on the market price for lead and in no way assist to increased output or lower operating costs. Having been established, there is no prospect of amendment, and the establishment of a more equitable basis. In Broken Hill the lead bonus for the month of June is £A3 1s. per day, of £A15 5s. for each full week worked. This will mean that the lowest paid man on the mines will receive £A28 9s. 6d. per week. The bonus is paid to all mine employees, including office staff. At Mount Isa Mines the bonus must be paid to all workers in the copper section of operations; and to all labour in outside mines in the Mount Isa-Cloncurry district, irrespective of the fact that the basic idea is a payment by a large, and profit-earning company, whereas those who are forced to pay the equivalent addition to their wages may be in no way connected with the lead mining industry, and may be engaged in unprofitable enterprises.

A case in point is that of Mary Kathleen Uranium, which is commencing a three year construction programme, with no production during that period, and consequently no revenue. Yet, unless the burden of the lead bonus—which is no incentive but a share in the market price of lead received by another company—is to be carried, or labour will not be obtained. The Broken Hill Associated Smelters at Port Pirie, South Australia, has paid a lead price bonus of £A5 per week; the Company has offered to add to this bonus a supplementary scale to provide a progressive additional bonus to a maximum of £A3 per week. The industrial agreement at Broken Hill and Port Pirie is now under consideration for the next three years.

OTHER DEPOSITS

Australian Mining and Smelting Co. Ltd., a subsidiary of Consolidated Zinc Corporation Ltd., has applied for nine leases near the Rum Jungle uranium mine, which is being worked for the Commonwealth Government by Territory Enterprises Pty. Ltd., an offshoot of the same parent company. The objective is prospecting for commercial occurrences of lead ore. It is stated that there are strong signs of a large deposit of lead in this vicinity; it appears, however, to be of low-grade.

Fresh interest has been added to the active search for beach sand deposits containing rutile and zircon by the announcement that Dowsett Holdings of London has proved important titanium bearing deposits on Bathurst Island, off the coast of the Northern Territory.

There is growing comment on the fact that so little attention has been given to the titaniferous iron sands on the New Zealand coasts. These deposits are very extensive and contain a very large tonnage of ilmenite.

Geological survey of the Solomon Islands has been in progress and the second phase is nearing completion. This work was initiated by the discovery of gold in rivers heading from Gold Ridge, and one Australian mining company, Clutha Development Ltd., is interested. Large scale prospecting operations are in progress, and much road making has been carried out, leading to Gold Ridge and other occurrences discovered during the course of the work. The outcome of the prospecting and mining operations may have an important influence on the future of the Islands.

URANIUM IN FRANCE—II.

Processes Used in the Treatment of French Uranium Ores

By MAURICE MOYAL

The following article, the final instalment of two, presents a proportion of hitherto classified information with regard to the various chemical and physical processes used in the production of uranium in France. The article thus completes the picture provided in our last issue wherein the location of ore deposits and of the treatment plants were described. Photographs are reproduced by courtesy of the Commissariat a l'Energie Atomique.

In the French method, low grade ores, containing less than 0.2 per cent uranium, are physically or chemically treated in plants on the spot. The resulting concentrates and high grade ores, containing from 0.2 to 1 per cent and sometimes an even higher percentage of uranium, are shipped to the Le Bouchet plant, built in 1946 at Vert-le-Petit, in the Greater Paris area.

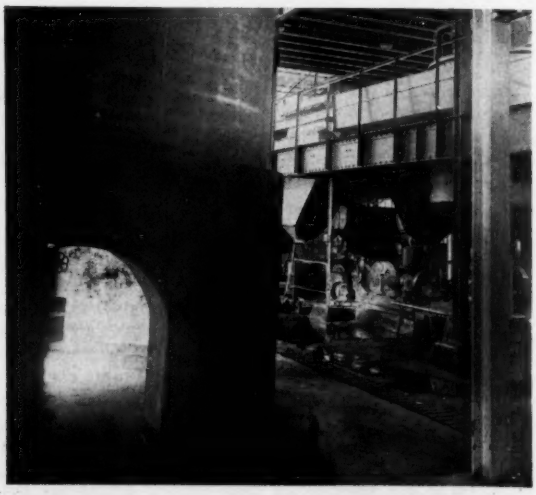
In this plant, covering over 18 acres, the ores are dried in furnaces and are ground. After grinding the ore is pulped with water. Various processes used will allow recovery of up to 97 per cent of uranium.

STAGES OF TREATMENT

During extraction into pure uranium metal mattes, the ores undergo three stages of treatment. First, the concentrate is turned into sodium uranate. Second, the uranate is processed into pure oxide. Third, the oxide is reduced into the metal.

Treatment varies according to the origin, type and degree of concentration of the ores. Allowing for some measure of variation in each particular case, the following flow sheet is applied to all ores and concentrates. The pregnant solution is invariably decanted through stainless steel Dorr Oliver thickeners, and the waste material is thoroughly washed through press filters. The recovery of such impurities as lead, titanium and zirconium is under study.

The solution is treated by sodium carbonate, which precipitates such metals as iron, manganese, lead, etc., as hydroxides and phosphates, leaving the uranium solution as uranyl carbonate. This, in turn, is treated by a boiling solution of caustic soda which precipitates the sodium uranate.



Ore treatment workshop at the Le Bouchet plant

Besides employing the nitric acid process now in general use, the Le Bouchet plant is also equipped for sulphuric acid treatment. A satisfactory process has been evolved for treating flotation concentrates, containing a considerable amount of organic reagents. With ores of high lead content, the treatment will precipitate this metal. In the cases of complex ores, the plant combines the features of several processes and thus avoids difficulties attendant upon treating each ore separately.

It is noteworthy that radium is no longer recovered but, in the course of treatment, great care is taken to render it non-soluble by the addition of barium carbonate and, if need be, of sulphate ions so that the radium-barium sulphate remains insoluble in the waste material. This helps to prevent the pollution of the rivers into which the waste is let.

PURIFICATION OF URANIUM COMPOUNDS

The purification of the sodium uranate obtained from various types of ore is based upon the solubility of uranyl nitrate in organic solvents. For this extraction, ether has been abandoned as too dangerous, while the use of hexane has been discontinued because this had to be employed in conjunction with ammonium nitrate.

Tributyl-phosphate has become the accepted medium. Although expensive, tributyl-phosphate is exceptionally long-lived. It is capable of almost total recovery.

Extraction is accomplished in counter current stream in two 15 ft. high columns fitted with Rashig rings. Distilled water percolates down the column and the nitrates of all other metals remain in aqueous solution, while the solvent containing the uranyl nitrate is emitted at the top. In practice, only a very limited amount of uranium stays at the bottom of the columns and even this can be recovered.

After subsequent purification in another column, nearly all impurities have been eliminated but the uranium is still in the form of a diluted nitrate solution. To transform it into the solid state, precipitation of uranium in the form of UO_4 has been chosen because it has the advantage of eliminating further impurities.

The solidification is accomplished in heated and continuously agitated vats by the addition of oxygenated water and ammonia, the latter serving to stabilize the pH of the solution during precipitation. After filtration and washing of the UO_4, there still remain some traces of iron, manganese, silica and other impurities, in the following ratios :

Fe	1.5	parts	to	1,000,000	parts	pure	oxide
Cr	0.4	,,	,,	,,	,,	,,	,,
Cu	0.3	,,	,,	,,	,,	,,	,,
Mo	0.3	,,	,,	,,	,,	,,	,,
Ni	0.2	,,	,,	,,	,,	,,	,,

Thus, such neutron-absorbers as cadmium, boron, lithium

and rare earths have been for all intents and purposes eliminated in the pure oxide.

REDUCTION OF PURE OXIDE AND EXTRACTION OF URANIUM METAL

Uranium mattes have been produced on an industrial scale at the Le Bouchet plant since 1950. While the purity of the metal produced has not been appreciably increased, the process evolved at Le Bouchet has been greatly improved.

The following are the principal stages in the production of the metal from UO_4.

(a) Heating at about 400 deg. C. converts UO_4 into UO_3;

(b) UO_3 is converted by ammonia gas into UO_2 in a vertical, continuous retort;

(c) UO_2 is briquetted;

(d) The UO_2 briquettes are converted by hydrofluoric acid into uranium tetrafluoride in a vertical, continuous retort;

(e) Reduction of the tetafluoride by adding shavings of pure calcium to the melted uranium and subsequently cooling it into mattes.

Initially, a stream of hydrogen at about 750 deg. C. in a vertical furnace was used to reduce UO_2. To facilitate control of the reaction, the nitrogen had to be added. Subsequently, cracked ammonia was used. Currently, however, the reducing agent is a stream of ammonia, the gas being dissociated on contact with uranium oxide. The oxygen released acts as a scavenger and improves the efficiency of the process. Thus a 3 ft. high vertical oven and a 3 ft. cooler are sufficient to reduce one tonne of oxide per 24 hr.

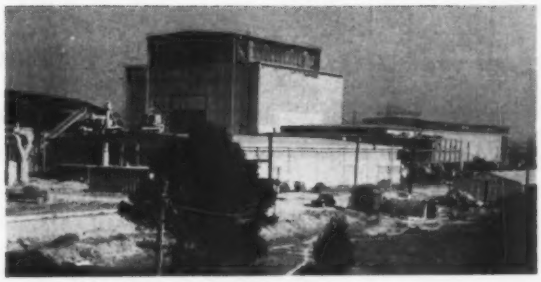
The UO_2-UO_4 reduction furnaces function automatically, the gas volumes are measured and controlled by rotameters, and the final product, which is slightly reactive to oxygen, is handled in an inert atmosphere.

FLUORINATION METHODS

For the last five years the method of fluorination used at Le Bouchet plant has been to transform UO_3 by attacking it with a 40 per cent solution of pure HF. The reaction takes place in an ebonite vat equipped with a mixer made of the same material, the volume of HF being about 25 per cent in excess of the theoretical amount. To prevent the temperature of the mixture from rising above 60 deg. C., the oxide is introduced gradually and is constantly stirred. The mix is passed through an ebonite filter fitted with polyvinyl chloride cloth. It is washed in a very dilute solution of HF and finally, in methanol.

The drying of uranium tetrafluoride calls for the utmost care, for moisture would result in a noticeable reduction in the quantity and quality of the metal. On the other hand, too lengthy drying at too high a temperature in air would result in a hydrolysis and a marked oxidation of the metal.

After being suspended for a period in an air stream, the cake, still containing 50 per cent of water, is dried at 200 deg. C. in a furnace lined with lead. Still containing 2-3 per cent of water, it is then passed through a crusher which, to avoid the addition of new impurities at this stage, has been surfaced by uranium metal. It is dried the second time at 500 deg. C. in hydrogen in a vertical copper furnace. The moisture content is now only about 0.3 per cent, the corresponding loss in weight having been brought about in vacuo at 150 deg. C. The product is free from uranium oxide and contains a very small amount of uranium hexafluoride.



A general view of La Marcoule atomic station. The 61 reactor building is in centre

The anhydrous fluorination plant currently in use at Le Bouchet resembles that used for the UO_3/UO_2 reduction process. This process has been finally adopted after a few unsuccessful experiments, e.g., fluidization, furnace fitted with trays, etc.

The use of the current trayless vertical furnace has been made possible by the prior briquetting of the uranium oxide into pellets, thus facilitating automatic control. The furnace, apparatus and secondary circuits have been made out of special materials such as monel, copper, graphite and synthetic resins, all of which are corrosion-resistant. The problems of corrosion vary from point to point.

SPECIFIC APPARATUS

The apparatus consists of a vertical tube, slightly widened at the base, set in an electric furnace, which is used only to prime the reaction. Once started, the exothermic reaction generates sufficient heat to maintain the temperature which is held at 450-500 deg. C.

The gas used may contain a certain amount of nitrogen, and even hydrogen, and invariably some hydrofluoric acid, at least 20 per cent in excess of the theoretical amount. The resulting tetrafluoride may contain from 1 to 1.2 per cent of oxygen without interfering with the next operation.

The crucibles are made of stainless steel, and lined with calcium fluoride to avoid contamination of the metal. Crucibles of pure calcium fluoride obtained from purified natural fluoride are capable of holding molten uranium without deformation.

The crucible filled with a mixture of UO_4 pellets and calcium shavings is covered by a steel hood and evacuated to be filled subsequently with argon.

At the start of the reaction excess calcium is allowed to escape through an aperture. After the reaction, which lasts for only a second or two, the receiver is closed again and the matte is cooled in an argon atmosphere by a water-cooled jacket.

The matte, topped by a mass of melted uranium tetrafluoride, is extracted from the crucible by a special apparatus. Each furnace is capable of producing a matte a day, which may weigh anything up to 220 lb.

As early as 1950, uranium mattes were turned out on an industrial scale at the Le Bouchet plant.

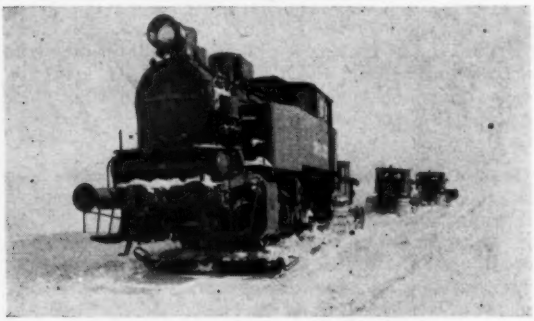
French-produced uranium has now a 99.999 per cent pure metal content.

By July, 1956, the La Marcoule pile will be generating over 40 megawatts for the nation's grid. By 1960, a whole series of atomic plants in the valley of the Loire river, in Middle France, will be generating enough electric power to provide for a greatly increased consumption, which is expected to double within less than ten years.

Russian Mining Developments in the Arctic

The considerable mineral resources of the Arctic are now being exploited on a large scale by Soviet Russia, one facet of this development being the construction of rail links between the ore fields and the consumer areas further south. The following article presents a cross section of the ores being mined in the Arctic as well as the specific areas in which operations are taking place.

Mining and industrial development in the Arctic has increased to an enormous extent in recent years, owing to the discovery of the vast natural resources of the region. Iron ore, coal, gold, uranium and many other minerals are found in profusion and are being systematically worked.



Winter in the Kola Peninsula. During railway construction the engines were delivered on sleighs hauled by tractors

To keep pace with the mining industry the Soviet Union is extending its railway systems eastwards to transport the products of mine and factory. The railway and canal systems between the Baltic and the White Sea have been developed and are now in full operation, while new roads and railways have been constructed across the tundras to increase mining and industrial projects in the Arctic and Siberia. North-east of the White Sea are claimed to be the largest copper deposits in the world, coal fields, as well as deposits of tungsten, gold, iron ore, silver, lead, and zinc. Copper is also obtained from the mines at Lake Baikal. Important discoveries of uranium have been found at Altai in Western Mongolia near the Russian border at Illi and Chuchak.

WIDE VARIETY OF DEPOSITS

In the Pechora district, east of Murmansk, coal deposits with an overall estimated reserve of 400,000,000 tons have been discovered as well as several oilfields. There are in addition 20 areas where gold is being mined, 24 with iron and copper ore, six asphalt deposits and 18 deposits of graphite. Coal from the Pechora district is carried by rail to the White Sea and the trains return with miners and mining machinery. Under the Fourth Five-Year Plan the coal output from Pechora is to be increased to an annual output of 2,000,000 tons. The production of oil in this district has been greatly increased and drilling is to be extended under the current Five-Year Plan. Platinum and gold are being mined in the Ghuki Peninsula and opalite in the Kola Peninsula. Oil wells have been sunk at Ukhta Pechora and at Khatanga while in addition the salt mines of this region are being developed.

The pig iron works at Leningrad are fed by the coking coal supplied from Pechora and the iron ore of the Kola Peninsula. The recent development of the Pechora coal fields is shown by the production increase of nearly 8,000,000 tons since 1945. The most important tin producing area in the U.S.S.R. is situated in Chaunskaya Guba in the north-east of Siberia.

Immediately after the second world war the Russians began to develop the mineral resources of Svalbard (Spitsbergen) where it was known that coal, asbestos, zinc, marble, phosphorites and magnesites were to be found in considerable quantities. Operations were treated with the utmost secrecy and nothing definite is known as to the actual work now being carried out. It is known, however, that the Russians have bought an important mining concession for the extraction of coal which is urgently needed for the industrial bases in Karelia and the Kola Peninsula and Northern Siberia

There are extensive coalfields and deposits of iron ore in the neighbourhood of Mukden and west and north of Vladivostok. At Mukden itself there are heavy industries and engineering works. The mines of Siberia are expected to produce rather more than 25 per cent of the Soviet Union's coal, about six per cent of its oil, and more than 15 per cent of its steel.

As part of these developments, new towns have been built with mines, mills and blast furnaces. New roads and railways have been constructed linking the new towns with the Trans-Siberian railway system.

DIFFICULTIES OF TRANSPORT

The great difficulty with which the Russians are faced is transport from the mines to the sea ports. It was found to be impracticable to construct railways northwards from the Trans-Siberian Railway to the new mining areas far away in Northern Siberia. Accordingly it was decided to make use of the great rivers draining into the Polar Ocean from Arctic European Russia and Siberia. At the coast the minerals are transported by sea westwards to the Kara Sea and the Atlantic or eastwards to the Bering Straits and the Pacific.

In order to facilitate the transport of coal from the Vorkuta coalfield, a railway has been constructed eastwards from the Murmansk track to the coalfields on the coast of the Kara Sea. This railway is 700 miles in length and was completed during the last world war. By the end of the war it had carried some 10,000,000 tons of coal besides serving many new river ports and industrial settlements.

Removing overburden at an apatite mine in the Kola Peninsula, above the Arctic Circle

Research at R.S.M.

Guests of the Imperial College of Science and Technology recently were given an opportunity of inspecting the new geochemistry and applied geophysics laboratories at the Royal School of Mines. This establishment was opened more than a year ago and so far the cost of equipping its laboratories has been in the region of £20,000. The research work conducted in these laboratories is described in the following article.

The Mining Geology Department of the R.S.M. has become the centre in Britain for the prosecution and intensification of research in geochemical prospecting, especially within Colonial territories. Generous funds have been made available to the Imperial College for this purpose by the Colonial Office and the D.S.I.R. Active work is being carried out in various parts of Africa in mineralized areas containing copper, gold, lead, zinc and other metals. With the collaboration of Colonial Geological Surveys and interested mining organizations, it is confidently expected that many more contributions will be made towards the improvement of mineral exploration techniques.

The geochemistry laboratories are equipped for instruction and research in both pure and applied geochemistry. In addition to a large laboratory for the chemical analysis of minerals, rocks and soils, there are laboratories devoted to spectrochemical analysis and to the study of trace elements in geological material by means of large quartz spectrographs and other modern instruments, together with sample preparation and balance rooms. A mass spectrometer is expected in two years' time and an X-ray laboratory is close at hand. Several research cubicles are available for postgraduate workers.

Before the present decade, the analysis of a silicate rock was a lengthy business demanding high chemical skill. To-day the position has radically changed, due principally to the rapid methods of silicate analysis initiated by the U.S. Geological Survey. In the geochemical section at the School of Mines these methods have been substantially modified and a productivity of 10 analyses per man week can readily be achieved after a few weeks' training.

Current research in pure geochemistry includes a detailed study of variations in the chemical nature of granitic, gabbroic and metamorphic rocks, using rapid spectrochemical methods of analysis. A critical comparison is being made of analytical data for specific elements obtained from an individual sample when employing gravimetric, spectrographic, colorometric and polarographic techniques of analysis.

CHEMISTRY OF THE RARE EARTHS

The chemistry of the rare earths is incompletely known. Chemically these elements are so similar that even to-day it is difficult to obtain Tb or Ho completely free from rare earths of adjacent atomic number. Rare earths are being used to-day in the manufacture of special optical glasses and gadolinium compounds have applications in the attainment of temperatures a few tenths of a degree above absolute zero. Recently Gd has been adopted in atomic pile control operations on account of its efficiency as a neutron absorber, which substantially exceeds that of boron. Knowledge of the distribution of the rare earths is therefore of particular interest.

It has been known for some time that Pb in some temperate soils tends to concentrate towards the surface layers and the mechanism of this concentration is being studied.

The mass spectrometer now on order is especially designed for work on solid materials. It is proposed to use it for studying the distribution of the two Cu isotopes in Cu minerals, thereby helping to unravel the intricate problems of ore genesis.

A flourishing research school in applied geochemistry is concerned with critical investigations of known geochemical prospecting methods, with the development of new field and laboratory techniques, and with the fundamental principles involved in the formation and detection of geochemical dispersions and anomalies of economic significance.

APPLIED GEOPHYSICS

The Department possesses a wide range of modern prospecting instruments such as magnetometers of various types, a Worden and a North American gravity meter, field reflection and refraction seismic equipment, and a variety of electrical instruments for resistivity, spontaneous polarization, electromagnetic and other field surveys. Facilities are available for testing and calibrating these instruments and also for the measurement of relevant physical properties of rocks and minerals. In the students' laboratory model experiments, simulating field conditions and using field equipment where possible, have been developed to illustrate many of the principles employed in geophysical prospecting.

Instruction in applied geophysics is provided at three different levels. At undergraduate level lectures, laboratory work and field work are devoted to the use of geophysics in the search for economic minerals; at postgraduate level students embarking on a career in exploration geophysics receive specialized training; students with suitable qualifications can follow a course of research leading to higher degrees.

On the research side one large laboratory and several small ones are devoted to projects covering many aspects of geophysics. In the electrical field, research is being conducted into the development of an induced polarization method of detecting orebodies. Seismic research is mainly concerned with details of the propagation of elastic waves through rocks. Two kinds of magnetic investigations are in hand; an academic study of the magnetic field in the geological past and the development of a mobile magnetometer. Efforts are also being made to design an instrument for the rapid calculation of gravity and magnetic anomalies.

Development of a new type of magnetometer based on nuclear magnetic resonance may speed up magnetic surveys on land. The instrument is based on the fact that the protons in the nuclei of certain media, such as water or alcohol, become polarized in a magnetic field of sufficient strength and that, on removal of this external field, they precess around the earth's field with a frequency depending on the strength of that field.

Promising results have been obtained in the development of an induced polarization method of locating good conducting orebodies. A current is passed through the ground to cause polarization at the points where it enters and leaves the body. If the energizing current is suddenly cut off, a secondary current flows due to the positive and negative poles on the body acting as the poles of a battery. This current flows for a very short time until all the energy stored during polarization has been dissipated, and sets up potential differences between points on the surface which can be measured and interpreted in relation to the buried polarized body. The effect has been demonstrated on models in the department's research laboratories and equipment is being constructed for field trials over known orebodies.

Stabilizing Old Mine Areas at Creighton, Ontario

The International Nickel Company of Canada has recently constructed a complete new underground concrete mixing station at its Creighton Mine in the Sudbury District of Ontario. The station operates with an entirely new push button system of blowing concrete by compressed air through pipes into constructional forms. The air-borne concrete, blown through hundreds of feet of pipe from the underground mixing station, is greatly expediting mining of low grade ore by induced caving. The following article describes this operation.

To stabilize areas of the Creighton Mine worked and abandoned 40 or more years ago, and to utilize old openings in which the timber supports have rotted and collapsed, extensive concreting is necessary. Very slowly and often only with the greatest difficulty could concrete be delivered to these locations until a push button system of blowing it there by compressed air was installed.

Several thousand bags of cement a month are now being used underground at Creighton to build slusher stations and drifts, box-hole brows, switchrooms, and other installations required to meet the caving project's quota of 12,000 tons of ore per day.

Concrete mixing stations are located on the 6th and 20th levels. Gravel for the concrete is received at the mixing stations by gravity from surface through a raise formerly used for bringing rock fill to the various levels of the mine. Control chutes have been installed in the raise for handling the gravel at each station. Cement is brought from surface by the mine's regular transportation system.

Located in large rooms which provide ample space for cement storage, the mixers can produce a 16 cu. ft. batch of concrete every three minutes. It is poured into the placer, a cylinder 2½ ft. in diameter by 10 ft. long, into

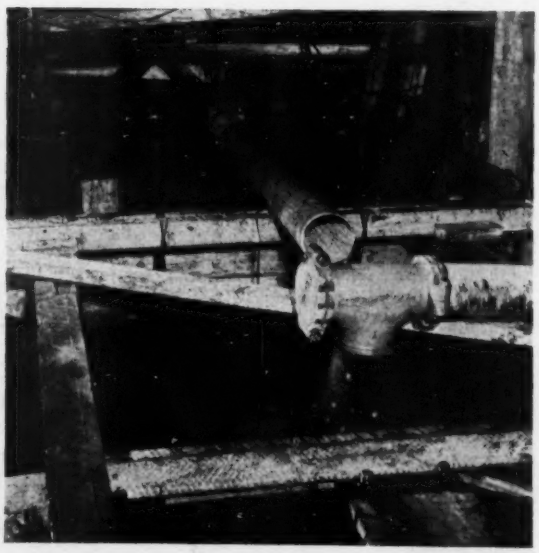
(Top): Concrete being poured from the mixer into the placer; (Centre): An abandoned heading in the old workings transformed to a useful slusher drift by the new concrete blowing system; (Below): The concrete being blown direct into the forms

which compressed air is then introduced from the mine's main air line.

From the placer the concrete is blown through a line of 6 in. steel pipe which carries it along levels, up or down manways, and through the mine's workings until finally, perhaps a quarter of a mile or more from the mixing station, it drops into the forms at the construction site.

At 90 deg. turns in the line T-bends are used; an air cushion which forms in the dead end of the T greatly reduces abrasion from the concrete. On long curves sections of 8 in. pipe are inserted, with ni-hard liners; standard steel elbows last as little as two hours under the impact of the concrete at these turns but the ni-hard liners, made of a very tough nickel alloy, were unchanged after six months of operation.

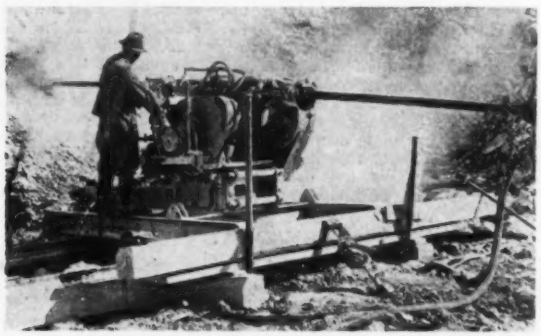
The best "up" delivery so far was a total of 1,315 ft. from the 20 level placer, consisting of 875 ft. on 20 level, up 210 ft. on a 47 deg. incline, 100 ft. on the horizontal, up 50 ft. at 90 deg., and finally 80 ft. on the horizontal. The 6 level station takes credit for the longest "down" delivery to date, a total of 1,670 ft. from the placer into the forms for a new slusher station on 14 level.



MACHINERY AND EQUIPMENT

Wide Range of Equipment for the Mining and Quarrying Industries

The range of equipment manufactured by Salzgitter Maschinen Aktiengesellschaft finds a wide variety of applications in the mining and quarrying industries. An example is the manufacturers' H.60 drilling machine designed for a direction of drilling in any oblique position between the horizontal and vertical. Blast hole drilling depth is approximately 330 ft. to 395 ft., while prospecting holes can reach a



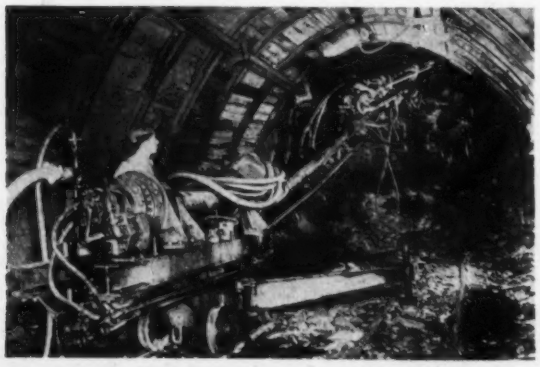
Salzgitter rock and prospecting drilling machine type H 60 drilling horizontally in a quarry

maximum depth of 660 ft. Feed speed of the spindle is up to 6 f.p.m. and the unit, which can accommodate a range of orifices from over 2 in. dia. to over 7 in. dia. for both blast and prospecting drilling, is 8 ft. 10 in. at maximum length.

A further equipment of interest is the PWO5 drill carriage, a parallel guide unit for underground operation. Operating on a swinging principle, the machine has a wide operating range that makes boring possible from one track even in double track headings. The dimensions are reduced, and thus the PWO5 is easily transportable. Indeed, the transport measurements coincide in width and height with the usual dimensions of mine cars. The PWO5R is a caterpillar-mounted combination rotary and percussion drilling machine for trackless underground operation as well as work in quarries.

Other units of Salzgitter manufacture include the rotary-cum-percussive drill V100, intended for drilling blast holes underground and at the surface and for mounting on carrier elements. A further machine is the self-propelled shuttle car type BP8K with cable drum for handling small-size and coarse materials, especially in underground rooms.

The Rotary Disc Loader is a novel high capacity loading machine for loading and recovering piled materials up to lumps 1 ft. 8 in. in size. Loading capacity is approximately 70 to 100 cu. m., and the loader is of low construction to allow for operations underground. A further unit is the Rotary Disc Loader (winning loader) type FKL 1250 and the range of throw shovel loaders includes the big model EGL.



Drill carriage type PW05S blast hole drilling underground

A Diesel-Mechanical Shunting Locomotive

The first two prototypes of a new design of diesel-mechanical locomotive have recently been produced by Peckett and Sons Ltd. For the first time a fully automatic mechanical transmission has been developed for locomotive work, offering the ease of control of an electric or hydraulic system coupled with a high transmission efficiency and simple robust parts. The unit has an obvious surface application within the mining industry, for example in the shaft area, in quarries or in open cast mines.

The locomotive is nominally of 200 h.p., has an overall weight of 32 tons and is designed for shunting. It has an overall length of 20 ft. 4 in. with an 0-4-0 wheel arrangement and a wheelbase of 5 ft. 6 in. which allows it to traverse a minimum curve of 50 ft. radius

The locomotive has a top speed of 13½ m.p.h. Bottom gear tractive effort is approximately 19,000 lb. The two prototype locomotives differ in that one is fitted with a Gardner type 8L3 engine developing 204 b.h.p. at 1,200 r.p.m., and the other with a Crossley type EST 4 developing 220 b.h.p at 750 r.p.m. By means of a different ratio in a pair of transfer gears the input shaft of the gearbox is in both cases driven at a maximum speed of 1,200 r.p.m. In all other respects the two locomotives are similar. The design has been arranged so that other well-known makes of diesel engine can also be accommodated.

The new Peckett diesel-mechanical locomotive

The four-speed automatic gearbox has been developed by Hobbs Transmission Ltd. in conjunction with Peckett and Sons Ltd. A twin-cylinder Broom and Wade air compressor provides air for the Westinghouse air brake.

New Type Geiger Counter

A new kind of radioactivity detector which promises to seriously challenge the present supremacy of the scintillation counter in the uranium prospecting field is announced by The Radiac Co., of New York. This instrument, called the Multi-Lokator, features the use of the new Geiger Multiplier tube, and is actually a new approach in Geiger counter development.

The Geiger Multiplier tube can be described as a bundle, or sheaf, of Geiger tube elements in a common housing, of which the cathodes are in the form of grid-like screens. This offers several chances for each gamma ray to produce an ionizing event.

MINING MISCELLANY

The total value of Australian minerals produced last year is likely to reach the record total of about £195,000,000. Mineral exports last year were valued at A£71,500,000 compared with A£58,000,000 in 1954. Exports this year are expected to be even higher.

* * *

The Commissioner of Lands and Mines in British Guiana has expressed the opinion that manganese is likely to become the second most important mineral in the Colony. A survey by the North West Guiana Mining Company, an associated concern of African Manganese, is expected to be completed this year.

* * *

Three companies are now actively engaged in prospecting for radioactive minerals in Tanganyika by means of aircraft fitted with scintillometers. They are Williamson Diamonds, Anglo-American Prospecting (Africa) and a subsidiary of Anglo American and New Consolidated Gold Fields. Between them they are prospecting over 120,000 square miles.

* * *

The Japanese Government has received a request that Japan supply 15 mining experts for technical assistance in the development of mineral resources in Bolivia. The Bolivian Government made the request following the visit of a Japanese mining survey team to Central and South American countries.

* * *

Sherritt Gordon Mines, Ltd., is preparing to step up mining operations at Lynn Lake through the installation of a second power plant—to be in operation before the end of 1957—and sinking of a new shaft to the 2,000 ft. horizon. At the annual meeting shareholders were told that the company's Fort Saskatchewan refinery is operating at the rate of 10,000 s.tons of nickel production per year and is also making cobalt metal. Results of a copper pilot mill are reaching a point which would allow a unit for commercial-scale production to be designed.

* * *

Aerial photographs taken in the course of recent mapping flights over coastal territory have raised hopes of the existence of payable bauxite in a large area extending from the vicinity of the Demerara River to that of the Berbice River. This area lies south of the McBride Oil and Gas Corporation's concession and north of the lands held under concession by the Demerara Bauxite Co. Ltd. It covers nearly 860,000 acres and exclusive permission to hold it for examination has been applied for by the Harvey Aluminium Corporation of U.S.A.

* * *

The Harnischfeger Corporation has been awarded a contract by the Southern Peru Copper Corporation of Toquepala, Peru, for ten 30 ft. high electric mining shovels equipped with dippers of eight cu.yd. capacity. The shovels are needed to remove 120,000,000 tons of earth for a new copper mine which will begin production during the second half of 1960. The Peruvian Corporation is operated by the American Smelting and Refining Corporation, the Phelps Dodge Corporation, the Newmont Mining Company, and Cerro de Pasco.

* * *

La Société des Mines de Fer de Mauritanie has been studying the question of the removal of the iron ore from its mines at Fort Giraud in French West Africa. According to reports it has been decided to construct a railway from the mine to Port Etienne which will not pass through Spanish territory. The port will be deepened to permit large vessels to load the ore. It is expected that the construction of the railway will be completed within a year.

* * *

The Central Mining and Investment Corporation Ltd., of South Africa, has been granted a concession to prospect for minerals in Mozambique in the area of the Mavuzi River. The concession covers beryllium, tantalum, zirconium, diamonds, mineral oil, bituminous substances, etc., but radioactive minerals are excluded. Its main provisions are that the administration must be in Portuguese territory, the capital employed must not be less than £125,000, and 60 per cent of the shares must be held by Portuguese interests. The term of the concession is for five years with option of extension to 20 years.

* * *

On June 19 the Right Hon. the Earl of Swinton performed the opening ceremony at the plant of Hess Products Ltd. in Littleborough, Lancs., inaugurating the production of Armour chemicals in the U.K. The outstanding characteristics of these chemicals is that all of them are cationic or nonionic. Whether oil or water soluble, they all have the characteristic of exhausting on solids, as a result of which they are finding many applications as corrosion inhibitors, water-proofing agents, flotation agents, etc.

Nu-Swift Ltd. have concluded an agreement with Safety First Products Corporation of Elmsford, New York, for Nu-Swift to manufacture under licence and sell throughout the world—except in U.S., Canada, Mexico and certain other countries—the patented Safe-T-Meter dry powder extinguisher of advanced design, manufactured and marketed in the North American Continent by the Safety First Products Corporation. The necessary consent of the British Exchange Control has been obtained. The manufacture of the extinguishers and the powder will take place wholly at the Nu-Swift factory in Yorkshire.

* * *

Plans for handing over the Rhodesian Iron and Steel Commission to private enterprise and the development of Southern Rhodesia's steel industry at a cost of £8,000,000 have been outlined in an official statement. It is envisaged that under private enterprise, production should be quadrupled to some 200,000 tons of finished steel a year, and that a wire-drawing plant should be established at Bulawayo. The proposals contemplate the taking over by private enterprise of the steel works at Redcliffe, together with the iron and limestone deposits in the Que Que and Bukwe areas. In all, about 200,000,000 tons of high-grade iron ore alongside rail are involved.

PERSONAL

Lt.-Col. J. H. Levey, D.S.O., O.B.E., is no longer chairman and managing director of Offin River Estates, Ltd., but remains a director. Mr. J. W. Price has been appointed a director. Mr. H. G. L. Hopwood has resigned due to pressure of other business.

* * *

Mr. W. E. Groves has been appointed to the board of the Consolidated Mines Selection Co., Ltd.

* * *

Mr. W. H. Napper has been appointed to the Purchasing and Stores Department of the National Coal Board with effect from July 2. He will assist in the development of the purchasing side of this new department.

* * *

Mr. P. R. Scutt, managing director of Tecalemit Ltd., has left by air to visit the U.S. and Canada. He is concerned in ways and means of expanding the company's business in these two countries and will deal with production problems arising from the opening of the new factory in Rexdale, Toronto.

* * *

Mr. Michael F. Kelly has been appointed South Eastern Area tractor representative of Mackay Industrial Equipment Ltd.

* * *

A paper entitled "A Comparative Study of Tools for Rotary Drilling in Rock," by B. G. Fish, M.Sc., and J. S. Barker, B.Sc., will be presented at a meeting of the North of England Institute of Mining and Mechanical Engineers to be held at Newcastle upon Tyne on June 16.

* * *

Baird and Tatlock (London) Ltd. have been appointed suppliers to the U.K. Atomic Energy Authority.

* * *

The Bradford office of the Export Credits Guarantee Department has been transferred to Britannia House, Bridge Street, Bradford 1 (Telephone, Bradford 25147).

CONTRACTS AND TENDERS

Formosa

International Co-operation Administration (I.C.A.), Ten./19688. Hoists and accessories, pneumatic drilling machines and accessories, drill rods and rock drill bits. Project Implementation Order No. 84-21-259-9-60132. Issuing authority, Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan (Formosa). Closing date 10/7/56. B.O.T. Ref., ESB/14593/56/ICA. Telephone enquiries to Chancery 4411, Extension 360.

* * *

India

TEN/19790, 1 ton capacity coal buckets. Issuing authority, the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. Closing date July 3, 1956. B.O.T. Ref.: ESB 15124/56. Telephone enquiries to Chancery 4411, Extension 738 or 771.

* * *

The closing date for the receipt of bids in connection with the main project for development of the lignite mines at Ptolemais (Northern Greece)—mining installation, briquette factory, coking plant and small power plant—has been postponed to July 15, 1956 (*vide, Mining Journal*, May 18, 1956, p. 613).

METALS, MINERALS AND ALLOYS

COPPER.—Copper has fluctuated in London in the past week although the price has not moved significantly away from £300. Various reasons have been given for the shows of strength; among them Russian buying (which exists but not in great volume), the weakness of sterling (but since copper's fall is not yet finished it is no smaller a risk than holding sterling and nobody really believes that devaluation is imminent) and an upsurge of industrial activity (which has not been particularly noticeable). In fact, the steadiness probably means no more than that it was time to call a halt to London's fall till the American trend is clearer.

The London firmness has stiffened the American market without making any difference to the published quotations. The big producers still quote 46 c. per lb. and the custom smelters 40 c. No. 2 Scrap copper has moved upward from 30 c. from time to time as sentiment improved, going as high as 33 c. However there is no eagerness to buy metal especially with the holiday season now approaching—and for many consumers there will be extended holidays this year. Indeed although the big producers still seem anxious to see the wage negotiations through before adjusting their price there is no serious concern among American consumers about the possibility of a strike in copper mining or of its consequences. A slight stir was caused by the report of a strike in the Sudbury, Ontario, mine of International Nickel but this was a wildcat and was over in a matter of a few hours. It is generally believed that the miners will want roughly the same from this year's settlement as the steelworkers are able to get from theirs; but so far there is no news of agreement from the steel industry.

It was suggested last week that, in the maintenance of the present price of 46 c., a bigger factor even than the wage negotiation was the delicacy of coming to some agreement with Chile over the pricing of American mined output. It has now been reported from Santiago that Anaconda and Kennecott may suggest to the Chilean government the advantage of re-establishing price freedom in copper sales on the world markets. It should be added that this is as yet no more than talk in Santiago copper sales and that the Chilean Under-Secretary for Mines has said that the companies have not yet made any such suggestion. It is quite possible that the story is well wide of the mark; and it is also possible that the notion of "re-establishing price freedom" means no more than importing a little flexibility into American pricing arrangements. Yet, whatever the meaning of this report it is certainly true that the lack of agreement with the Chilean government is the main obstacle to a reduction in the 46 c. level.

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LEAD.—Lead has worn a slightly happier look in the United States in the past week, partly reflecting a firmer tendency on the London market. Another bullish factor was the report that the American government has acquired a substantial quantity of lead (Comtel says about 15,000 tons) from European producers in exchange for bartered agricultural produce. It is hard for the American producers of lead, who have long complained that stockpiling helped the foreigner as much as the domestic producer, to see the deliberate stockpiling of foreign metal. But the immediate effect is to remove the threat of foreign imports and so preserve the existing price level of 16 c. per lb. Meanwhile G.S.A. has sent out its monthly call for domestically mined metal for delivery by August 15. Battery deliveries in April also showed a fair rise to 1,335,400 against 1,313,000 in March and 1,281,000 in April, 1955. This is the opening of the battery making season and it will be interesting to see how far the revival gathers pace. Sales of domestic lead also rose in the week ending June 6 to 6,550 tons against 5,461 tons a week earlier.

TIN.—Tin has fluctuated in New York in the past week between 94 and 95 c. per lb. for spot Straits metal with most of the interest being provided by the professional activity of dealers. An additional factor which lent support was the passage of the Texas City smelter bill authorizing the smelter's operation till the end of January, 1957. It is now open to the authorities to contract for concentrates for the smelter.

Meanwhile plans are in hand for the establishment of the tin agreement. The British government has convened a meeting of plenipotentiaries from all ratifying countries for June 29; it is thought likely that the I.T.A. will then officially exist as from July 1 and that the first meeting of the Council will be held on July 2. Presumably the first task of the Council will be to lay down guiding principles for the building up of the buffer stock. Ratifying countries are now busy arranging their delegations. Thailand will be represented by the Counsellor of the Embassy in London as an observer since she has not ratified. However, the Director General of the Mines Department of the Thailand Ministry of Industry has said that he expects his government to ratify shortly. The American government has apparently advised the Thai government that it has no objections to its joining, though the United States still intends to abstain. The impression that West Germany will ratify is also growing.

It is expected that the regulations for controlling the tin industry in Malaya will be published soon. The Malayan government will make a cash contribution to the establishment of the buffer stock and recover it by a levy from the tin industry. A government spokesman said, "We are now very far advanced with our domestic arrangements. We have got everything on hand for the local implementation of the agreement". Mr. D. T. Waring said that "although individually some may not like it, it is a fair accomplishment and we want to see it work as well as it possibly can".

The Malayan Mining Employees Union has demanded that the dispute (whether payments for weekly days of rest should be retrospective to November, 1954) should go to an arbitration court instead of an industrial court as decided in March. Union members are insisting that the settlement should be speeded up.

ZINC.—Zinc in the United States, like lead, has drawn some benefit from the news that the American government has begun to stockpile zinc from foreign sources against bartered farm produce. From time to time there has been a good demand for prime western grade but little interest has been shown in special high grade. American output of zinc in May reached 81,238 s.tons against 88,664 in April and 86,177 in May last year. Domestic deliveries amounted to 59,085 tons against 74,788 and 83,336 respectively. The government took 10,196 tons for the stockpile compared with 4,570 in April and 10,434 in May last year.

ANTIMONY.—Final annual data compiled by the Bureau of Mines show that the U.S. "new supply" of primary antimony in 1955 was about 15,800 s.tons, an increase of 37 per

cent over the 1954 supply of 11,500 tons. During the year imports of contained antimony for consumption totalled 13,000 tons, the highest since 1951, thus reversing the downward trend which had been in evidence for the past three years. Imports of ores and concentrates—chiefly from Mexico, Bolivia and the Union of South Africa—advanced by 58 per cent. Imports of metal—chiefly from Belgium-Luxembourg, Mexico and Yugoslavia—increased 31 per cent. Consumption of primary antimony in 1955 was 12,500 tons, an increase of 2 per cent above 1954. Of the total used, 63 per cent was in non-metallic products and 37 per cent in metal products. Antimony consumed in non-metallic products increased 14 per cent with larger quantities of oxide entering frits and ceramic enamels, flameproof compounds, and glass industries. Consumption of antimony in metal products decreased 13 per cent with antimonial lead and battery metal showing the largest decreases for the second consecutive year.

Indications that the trend of consumption is once more downwards are afforded by the returns for the first quarter of 1956, which have been released by the U.S. Bureau of Mines. Consumption of primary antimony during this quarter was 3,100 tons or 9 per cent less than the 3,400 tons used in the fourth quarter of 1955. Stocks held by consumers, dealers and smelters on March 31 were 3 per cent higher than the 8,400 tons reported on hand at the beginning of the year. Imports of primary antimony during the first quarter decreased by 37 per cent, amounting to 2,600 tons. Statistics compiled by the British Bureau of Non-Ferrous Metal Statistics show that consumption of antimony metal and compounds was slightly lower in the U.K. during the four months ending April 30, 1956, than in the corresponding period of last year, the respective totals (in terms of antimony metal) being 1,785 tons and 1,826 tons.

The decreased demand for antimony was referred to by Mr. B. L. Bernstein at the annual meeting of Consolidated Murchison (Transvaal) Goldfields. Discussing the future outlook, Mr. Bernstein pointed out that the antimony market was "quite unpredictable" and that, in view of Russian and Chinese competition, it was impossible to obtain reliable estimates regarding future sales.

COLUMBIUM.—Despite the fall in price Malayan production of columbite is increasing, states a report in *Tin*. Production is expected to exceed 300 tons this year, compared with 236 tons in 1955, 111 in 1954, and only eight tons in 1950.

MANGANESE.—Commenting on the market outlook at the annual meeting of Central Provinces Manganese Ore, the chairman, Mr. H. R. Holmes, referred to the higher prices being obtained by producers during the current year. The demand for the company's ore is at present good and should continue to be so in view of the increased world production of steel. So far as Central Manganese is concerned, the question of railings is of vital importance and these still remain unsatisfactory owing to the general demand in India for traffic facilities. Should more wagons be made available, and provided nothing unforeseen arises, prospects for the current year are regarded as reasonably satisfactory, though the company is faced with rising costs including wages, royalty and railway freight. A report of the chairman's speech appears on page 754.

NICKEL.—Further information on the nickel supply position has been given in testimony presented before the Senate Small Business Committee by Dr. Arthur S. Flemming, director of ODM. Dr. Flemming indicated that the nation's supply of nickel had risen since the Korea period by an additional 64,000 s.tons of metal annually and a further 64,000 tons will become available. He also revealed that the national stockpile of nickel had reached the halfway mark of its objective, rising to this point from October, 1953, when only 15 per cent of the nickel objective had been stockpiled. The amount available for the civilian economy is still below the Korean level. Mr. Henry S. Wingate, president of INCO, who also testified at the same hearing, said that the main producers and suppliers of nickel had been able to project their business allotments of nickel for the first time as a result of Dr. Flemming's recent announcement that 10,000 s.tons per quarter would be made available.

The London Metal Market

(From Our Metal Exchange Correspondent)

For the first time for many months lead and zinc have occupied the stage on the London Metal Exchange with substantial rises, and in zinc especially, turnovers have increased considerably. The reason for the advance has been the conclusion of a number of barter transactions whereby the U.S. government has delivered surplus farm produce and taken in exchange lead and zinc. It is believed that a fair tonnage has been done, and it seems possible that a shortage of the metals may develop in Europe unless the prices go to well above the American parity. Always in the background there is a fear of a recurrence of the labour trouble on the Australian waterfront, and this, combined with the continuance of a normal demand both in the U.K. and on the Continent, has contributed to the firmness of the market.

The copper market has also had a very firm undertone and quotations have advanced appreciably but with more hesitancy than in the case of other metals, and the majority opinion considers that any further rise will be limited unless trouble breaks out in America. The contango has been maintained, and, although it may disappear temporarily in the near future owing to the technical position of the market, it is expected that if supplies continue to flow as they are at the moment a backwardation is unlikely to develop.

The tin market has followed the example of the others, and here the price rise has been assisted by good demand and the realization that although a surplus will ultimately develop this is unlikely in the near future. On Thursday morning the Eastern price was equivalent to £752½ per ton c.i.f. Europe.

Closing prices and turnovers are given in the following table:—

	June 7		June 14	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£302½	£303½	£301	£301½
Three months	£305	£306	£302	£302½
Settlement	£303½		£301½	
Week's turnover	7,150 tons		7,100 tons	
Tin				
Cash	£730	£732	£745	£746
Three months	£729	£730	£741	£742
Settlement	£732		£746	
Week's turnover	760 tons		805 tons	
Lead				
Current half month	£111½	£111¾	£116¼	£116½
Three months	£109¾	£110	£113¾	£113¾
Week's turnover	4,450 tons		4,725 tons	
Zinc				
Current half month	£91¾	£92¼	£96	£96¼
Three months	£90¼	£90½	£94¼	£94¾
Week's turnover	6,400 tons		7,800 tons	

OTHER LONDON PRICES — JUNE 14

METALS

Aluminium, 99.5%, £189 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 12s. 0d. lb.
Chromium, 6s. 11d. lb.
Cobalt, 21s. lb.
Gold, 249s. 4½d.
Iridium, £29/31 oz.
Manganese Metal (96%-98%) £269 according to quantity
Magnesium, 2s. 4d. lb.
Nickel, 99.5% (home trade) £519 per ton
Osmium, £24/27 oz. nom.
Osmiridium, nom.
Palladium, £8 0s./£8 10s. oz.
Platinum U.K. and Empire Refined £34/£35 oz. Imported £37 0s./£38 0s. oz.
Rhodium, £42.
Ruthenium, £15/£17 oz.
Quicksilver, £87 ex-warehouse
Selenium, 112s. nom. per lb.
Silver, 78½d. f.oz. spot and 78¼ f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 60% 8s. 3d. c.i.f.
30% 5s. 0d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (semi-friable) 48% £15 15s. 0d. per ton c.i.f.
,, Refractory 45% .. £14 15s. 0d. per ton c.i.f.
,, Smalls 42% .. £12 15s. 0d. per ton c.i.f.
Magnesite, ground calcined .. £28 0s./£30 0s. d/d
Magnesite, Raw (ground) .. £21 0s./£22 0s. d/d
Molybdenite (85% basis) .. 8s. 2½d. nom. per lb. c.i.f.
Wolfram and Scheelite (65%) .. 264s.0d./269s. 0d. c.i.f.
Tungsten Metal Powder (98% Min. W.) .. 21s. 0d. nom. per lb. (home)
Ferro-tungsten (80%-85%) .. 18s. 0d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £39 3s. 9d. d/d per ton
Ferro-manganese, home .. £66 per ton
Manganese Ore Indian
Europe (46%-48%) basis 125s. freight .. .. 103d./105d. per unit c.i.f.
Manganese Ore (43%-45%) .. 97d./98d. per unit c.i.f.
Manganese Ore (38%/40%) .. 90d./92d. per unit
Brass Wire .. .. .. 3s. 1½d. per lb. basis
Brass Tubes, solid drawn .. 2s. 5½d. per lb. basis

COMPANY NEWS AND VIEWS

Markets Firmer But Turnover Still Restricted

The sudden illness of President Eisenhower was by far the most important influence on London and American stock markets during the past week. On receipt of this news, Wall Street took a bad knock and *The Dow Jones Industrial Index* fell to 475.29 thus breaking through its minor resistance level of 483.33. Although not fully reflected in London, this event considerably upset sentiment. However, due perhaps to severe falls experienced in recent weeks, the initial shock of this news was short lived and prices made a strong technical rally when it became known that the President's operation had been successfully concluded.

Talking points on the London market have included Mr. Macmillan's continuous warnings about the seriousness of the present economic position, while on the other hand trade figures for May were regarded as being well up to expectations. As in the U.S. no particular expansion of business took place but a better feeling was evident and sterling was strong.

South African gold issues gave a reasonable account of themselves during the week. This section of the market was stimulated by further consideration of the investment merits of finance issues. In place of the coming quarterly report, F.S. Geduld was a good spot, moving narrowly between 84s. and 85s. 6d. Amongst the older mines the market was well pleased with Randfontein's maintained dividend and the shares rallied to 40s. Geoffries, however, fell to 8s. on adverse feelings regarding the Riebeeck flotation. Elsewhere the turn was firm and only a negligible decline took place in the *Gold Index* to 78.6 from 79.1.

Under the favourable influence of Nchanga's higher dividend, making 30s. net for the year against 22s. 6d., coppers were strong. Rhodesians opened well on Thursday morning and gains were made throughout the list.

Higher metal prices for tin, lead and zinc had a hardening effect on all the issues concerned in these sections, a particular feature being provided by Consolidated Zinc which put on 1s. 6d. during the week to 49s. Trinidad Oil were a strong market at about 70s. 3d. on the government's statement regarding the bid from Texas Oil. In consideration of its holding in Trinidad, Central Minings were also firm.

Sir Ernest Oppenheimer on South African Investment

In the face of growing industrial uncertainties in both the U.K. and the U.S.A., it was encouraging to read in Sir Ernest Oppenheimer's statement to shareholders of the Anglo American Corporation of South Africa (extracts from which appear on page 751 of this issue) an optimistic assessment of the outlook for diamond sales. Demand for gem stones, in particular, said Sir Ernest, has been maintained at a high level during the first months of the current year, and prospects for the full year's trading most encouraging.

On the other hand, in view of the Corporation's great stake in copper mining, it was disappointing that no forecast regarding the price outlook for this metal was given. Recently, severe falls on the London Metal Exchange have engendered grave doubts as to whether present levels could be maintained should any widespread industrial recession develop. The implication of such a feeling is, of course, that copper shares must suffer bear attacks until the position becomes clearer. At the same time, it is wise to remember that due to lower bonus and royalty payments, which became payable at the reduced levels, earnings of Rhodesian producers are a good deal less vulnerable to falls in copper prices than most.

Some most interesting comments were, however, made regarding the recent discouraging state of gold share markets which had resulted—and continued to result—in falling profits made from share dealing. Several factors, said Sir Ernest, had contributed towards these conditions. These included the unsettled political state of world affairs and in particular the confused situation in the Middle East. This did not encourage British or other Continental investors to risk placing money anywhere but where it was readily at call and close at hand. Additionally,

LONDON STOCK EXCHANGE PRICES — JUNE 7 - JUNE 13, 1956

Finance	Price June 13	+ or — on week
African & European	2 1/16	
Anglo American Corpn.	7 1/4	— 1/16
Anglo-French	18/9	
Anglo Transvaal Consol.	1 1/16	
Central Mining (£1 shrs.)	43/9	+ 8/-
Consolidated Goldfields	53/3	+ 2/6
Consol Mines Selection	1 1/16	+ 1/16
East Rand Consols	1/9	— 4 1/2d
General Mining	3 1/4	
H.E. Prop.	7/3	
Johnnies	35/-	
Rand Mines	3 1/16	— 1/4
Rand Selection	1 5/16	+ 1/16
Union Corporation	36/6	— 3d
Vereeniging Estates	4 1/2	
Writs	31/3	— 7 1/2d
West Wits.	34/3	— 3d
Rand Gold		
Blyvoor	22/7 1/2	— 1 1/2d
Brakpan	6/3	
Buffelsfontein	24/4 1/2	
City Deep	10/6	
Consol. Main Reef	17/6	
Crown	1 3/16	
Daggas	2 1/2	— 1/2
Dominion Reefs	17/6	
Doornfontein	21/-	
Durban Deep	25/-	— 7 1/2d
E. Champs	3/-	
E. Daggas	9/4 1/2	— 1 1/2d
E. Geduld (4s. units)	30/6	+ 3d
E. Rand Props.	49/3	+ 9d
Geduld	4 1/2	— 1/4
Govt. Areas	4/-	
Grootvlei	20/4 1/2	
Hartebeestfontein	37/4 1/2	+ 3d
Libanon	7/3	
Luipaards Vlei	13/3	
Marievale	20/4 1/2	+ 5d
New Kleinfontein	4/1 1/2	— 3d
New Pioneer	13/4 1/2	— 6d
Randfontein	40/-	+ 6d
Robinson Deep	7/6	
Rose Deep	10/3	
Simmer & Jack	3/10 1/2	+ 3d
S.A. Lands	22/6	
Springs	2/6	— 1 1/2d
Stilfontein	24/-	+ 4 1/2d
Sub Nigel	30/-	
Vaal Reefs	29/3	— 1 1/2d
Van Dyk	2/-	— 3d
Venterspost	12/4 1/2	+ 4 1/2d
Vlakfontein	17/7 1/2	— 3d
Vogelstruisbult	17/-	— 6d
West Driefontein	5 1/2	+ 1/2
Rand Gold contd.		
W. Rand Consolidated	1 1/2	— 1/16
Western Reefs	1 1/2	— 1/16
O.F.S. Gold		
Freddies	7/-	— 3d
Freddies Consolidated	4/3	— 3d
F.S. Geduld	4 7/16	— 1/16
Geoffries	8/-	— 1/4 1/2
Harmony	23/3	— 6d
Loraine	5/6	— 3d
Lydenburg Estates	15/6	— 1/3
Merriespruit	8/9	+ 1 1/2d
Middle Wits.	11/9	— 3d
Ofsits	54/6	+ 6d
President Brand	54/-	— 1/-
President Steyn	29/3	
St. Helena	25/4 1/2	— 7 1/2d
Virginia Ord.	10/6	
Welkom	19/6	— 6d
Western Holdings	3 1/16	— 1/2
West African Gold		
Amalgamated Banket	1/6	
Ariston	4/1 1/2	— 3d
Ashanti	15/10 1/2	— 3d
Bibiani	2/1 1/2	
Bremang	1/4 1/2	
G.C. Main Reef	1/9	— 1 1/2d
Konongo	1/9	
Marlu	2d	
Taquah	1/7 1/2	
Western Selection	7/7 1/2	— 4 1/2d
Australian Gold		
Gold Mines of Kalgoorlie	12/9	
Great Boulder Prop.	11/-	
Lake View & Star	15/9	
Mount Morgan	20/9	+ 3d
North Kalgurli	7/9	— 3d
Sons of Gwalia	2/10 1/2	
Western Mining	9/6	
Miscellaneous Gold		
Cam & Motor	8/4 1/2	+ 1 1/2d
Champion Reef	6/-	— 3d
Falcon Mines	7/6	
Globe & Phoenix	27/3	+ 1/6
Motapa	1/-	
Mysore	3/1 1/2	
Nundydroog	9/6	
St. John d'el Rey	20/-	+ 6d
Zams	2 1/16 XR	+ 1/16
Diamonds and Platinum		
Anglo American Inv.	8 11/16	+ 1/16
Casts	22/4 1/2	+ 3d
Cons. of S.W.A Pref.	10/10 1/2	+ 1 1/2d
De Beers Defd. Reg.	5	+ 1/4
De Beers Pfd. Reg.	14	— 1/4
Pots Platinum	11/9	
Waterval	19/-	+ 10 1/2d
Copper		
Bancroft	41/3	+ 9d
Chartered	66/6	— 3d
Esperanza	3/-	— 1 1/2d
Messina	8 1/16	
Nchanga	13 3/4	
Rhod-Anglo-American	5 1/16	+ 1/4
Rhod. Katanga	26/-	+ 3d
Rhodesian Selection	47/3 XD	+ 9d
Rhokana	37 1/4	+ 1 1/4
Rio Tinto Reg.	2 1/4	
Roan Antelope	25/6 XD	— 1 1/4d
Selection Trust	4 7/16	
Tanks	7 1/16	— 1/16
Tharsis Sulphur Br.	4 1/2	— 1/4
Tin (Eastern)		
Ayer Hitam	21/3	+ 6d
Gopeng	9/1 1/2	+ 9d
Hongkong	5/7 1/2	+ 3d
Ipoh	23/6	
Kamunting	8/-	— 3d
Kepong Dredging	3/-	
Kinta Tin Mines	14/3	+ 9d
Malayan Dredging	9/1 1/2	
Pahang	10/10 1/2	+ 6d
Pengkalen	11/9	+ 6d
Petaling	7/10 1/2	+ 1 1/2d
Rambutan	24/6	
Siamese Tin	9/10 1/2	
Southern Kinta	14/9	+ 4 1/2d
S. Malayan	7/7 1/2	+ 1 1/2d
S. Tronoh	6/-	+ 4 1/2d
Sungei Kinta	14/6 XD	
Tekka Taiping	8/10 1/2	
Tronoh	9/-	+ 3d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	10/4 1/2	— 1 1/2d
Beralt Tin	42/9	
Bisichi	4/4 1/2	— 1 1/2d
British Tin Inv.	21/-	+ 9d
Ex-Lands Nigeria	2/3	— 1 1/2d
Geevor Tin	13/9	+ 3d
Tin (Nigerian and Miscellaneous) contd.		
Gold & Base Metal	1/6	
Jantar Nigeria	4/9	— 1 1/2d
Jos Tin Area	12/3	
Kaduna Prospectors	1/6	
Kaduna Syndicate	2/1 1/4	
London Tin	8/10 1/2	— 1 1/2d
United Tin	1/-	
Silver, Lead, Zinc		
Broken Hill South	55/-	+ 1/-
Burma Mines	6/4 1/2	+ 6d
Consol. Zinc	48/9	+ 1/-
Lake George	13/3	+ 7 1/2d
Mount Isa	17/9	
New Broken Hill	39/-	+ 1/3
North Broken Hill	4 1/4	
Rhodesian Broken Hill	10/-	+ 1 1/4d
San Francisco Mines	23/3	+ 3d
Uruwira	4/9	
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	47/-	
Associated Manganese	37/-	— 3d
Cape Asbestos	9/4 1/2	+ 1 1/2d
C.P. Manganese	28/-	
Consol. Murchison	2 1/16	
Natal Navigation	63/9	— 3d
Turner & Newall	102/- XD	+ 1/9
Wankie	17/6	— 6d
Witbank Colliery	4 1/2	
Canadian Mines		
Dome	$25 1/4	
Hollinger	$49 1/4	+ 1/4
Hudson Bay Mining	$148	+ 2
International Nickel	$170 1/2	+ 1/4
Mining Corpn. of Canada	£8 1/2	— 1/4
Noranda	$106	+ 2
Quemont	£9 1/2	+ 1/4
Yukon	4/6	
Oil		
Apex	36/6	+ 2/9
Attock	39/6	
Br. Petroleum	149/6	+ 5/9
Burmah	94/6	+ 3/3
Canadian Eagle	58/9	+ 3/3
Mexican Eagle	20/6	
Shell	8 1/16	+ 1/2
Trinidad Oil	71/-	+ 29/6
T.P.D.	43/6	+ 2/9
Ultramar	40/6 XD	+ 2/-

difficult economic conditions in the U.K. had resulted in a very high Bank Rate which tended to counteract the attractions of overseas investment for British capital. Although South Africa's political and racial tensions had obtained substantial publicity, the country did, in fact, offer extraordinarily favourable conditions for private enterprise. Potential investors had nevertheless been deterred by events. Another factor was that world competition for capital funds had seldom been more intense.

Increased Rand Dividends

Further dividend announcements from South African gold mining companies have included a number of increases. As statistics in respect of Transvaal producers as a whole have shown every sign that the trend of rising costs experienced during 1955 will be continued during 1956, these higher distributions must be taken to imply greater confidence that the present improved native labour supply is expected to be maintained. Should this be so, tonnage milled may again be stepped up during the current year. Apart from this consideration, production figures suggest that the grade of ore milled might also make some fractional gain.

Union Corporation	*Dec. 1954*	*June 1955*	*Dec. 1955*	*June 1956*
	s. d.	*s. d.*	*s. d.*	*s. d.*
East Geduld	2 0	2 0	2 3	**2 0**
Geduld	6 9	6 9	8 0	**6 9**
Grootvlei	1 1	1 1	1 4	**1 1**
Marievale	1 1	1 0	1 3	**1 0**
Consolidated Gold Fields				
Libanon*	3	3	3½	**3½**
Luipaards Vlei* ...	7½	7½	7½	**9**
Rietfontein Con. ...	1 3	1 1	1 2	**1 1**
Robinson Deep ...	1 9	1 6	1 6	**3** †
Simmer	5½‡	4	5	**5**
Sub Nigel*	3 6	3 6	3 3	**3 0**
Venterspost* ...	6	6	7½	**9**
Vlakfontein	7½	8	8	**9**
Vogels	1 6	1 7½	1 8	**1 8**
W. Driefontein* ...	1 9	2 3	2 6	**2 9**
General Mining				
S. Roodepoort* ...	9	10½	10½	**1 1½**
Stilfontein	6	6	6	**6**
W. Rand Con. ...	2 0	1 9	2 0	**1 9**
Johannesburg Consolidated				
Govt. G.M.A. ...	7½	4½	3	**3**
Randfontein	2 0	2 0	2 6	**2 6**
East Champ D'Or ...	—	3	4	**3**

* Companies ending their financial year in June.
† Previous three dividends included 3d., 3d. and 9d. additional payments respectively.
‡ Includes 1½d. additional payment.

General Mining: Investment Values Fall

Quoted investments shown on the consolidated balance sheet of General Mining and Finance Corporation at December 31, 1955, at £8,966,848 had a Stock Exchange value of £13,772,148. This represented a considerable decline from the previous year's figure of £16,064,360. Total assets of £20,445,677 compared with £19,637,429 at the end of 1954. Current liabilities advanced to £8,727,213 from £7,569,096 but current assets also moved up to £8,662,993 from £8,100,632.

After deduction of all expenses including the large item of £160,036 (£49,227) representing interest paid on fixed loans and deposits, the group's consolidated net income for the past financial year fell away to £923,780 from £1,332,398 in respect of the preceding year. This was due mainly to the absence of good profits from share dealing. It should be borne in mind, however, that the Corporation has yet to receive the full benefits from its recent absorption of the Strathmore interests. This is due to the fact that of the major investment holdings, only one—Stilfontein Gold Mining—has so far reached the dividend paying stage.

Some interesting information regarding operations at the Ellaton Gold Mining Company were given in the directors' report. At this mine, in which General Mining has a shareholding, a decreasing tendency in development values and percentage payability has been experienced. It had become apparent that a considerable proportion of the area thought to be underlain by Vaal Reef had been cut off by the overlying Gold Estate series. Values in the area south of present workings had compared most favourably with those in the fully developed section of the mine. This unsatisfactory trend has been confirmed by a series of boreholes adjacent to the southern boundary, pointing to a serious reduction in the life of the mine.

Other gold investments include a wide selection of mines in the Anglo American Group, including an important stake in F.S. Geduld.

At their present price of £6 12s. 6d. the £1 ordinary shares of General Mining yield about 6¼ per cent. Sir George Albu is chairman. Meeting, June 26, Johannesburg.

Gold Fields Pays 5 Per Cent Interim

Departing from its previously long established custom of paying only one dividend in respect of any particular financial year, the Consolidated Gold Fields of South Africa has declared an interim dividend of 5 per cent on its issued ordinary capital of £4,500,000 in respect of the year ending June 30, 1956. It will be recalled that a total of 17½ per cent was distributed in respect of the preceding twelve months.

HALKYN DISTRICT UNITED MINES LIMITED

The twenty-eighth annual general meeting of Halkyn District United Mines Ltd. was held on June 7 at Chester.

The chairman, **Mr. R. W. Bankes, C.B.E.,** presided.

The following details of operations during 1955 are taken from the directors report as submitted to the meeting and the statement of the chairman.

Mill throughput in 1955 was much the same both in tonnage and grade as in the previous year. Production of lead concentrates at 2,743 tons showed an increase of 13 tons over the 1954 figure but there was a fall in the production of zinc concentrates from the unusually high figure of 798 tons in 1954 to 621 tons in 1955.

Whereas in 1954 only 27 per cent. of total production came from stoping on the lodes in the southern end of the mine, as much as 52 per cent. came from that source in 1955. The percentage from development work in those lodes fell from 50 per cent. to 34 per cent., due chiefly to simultaneous weakening of mineralization in most of the development headings, though a contributory factor was the shortage of labour that developed early in the year and persisted for some months, which made it essential in order to maintain production to divert miners from development work to stoping. Owing to this curtailment of development work, ore reserves at the end of 1955 were about 10 per cent. lower than at the end of the previous year.

The main cross-cut south was advanced a further 876 feet during 1955 without cutting any lode or fissure of any consequence. The dry summer and autumn made it practicable, particularly when more labour became available later in the year, to devote much attention to improvement of conditions in the main cross-cut south, along which all ore has to pass on its way to the mill at Penybryn.

The accounts show a profit for 1955 carried to appropriation account of £65,426 (£50,199). After provision of £22,278 (£4,952) net for taxation and £11,602 (£13,705) for writing down capital assets, the available balance, including £42,952 brought forward from the previous account, but after providing £10,000 for future extension of the main cross-cut south, is £64,498. The balance carried forward, after deducting £17,739 for a dividend of 9d. per unit of stock, is £46,759.

It has not been possible to come to a decision regarding the establishment of new milling facilities farther to the south but the board consider it prudent, pending that decision, to conserve the company's liquid resources.

The chairman concluded his statement with an expression, on behalf of all members of the company, of sincere appreciation of the valuable services which Mr. G. W. Cradduck, the company's general manager, and his staff at Halkyn continued to render to the company and with an acknowledgment of the services of Messrs. John Taylor and Sons, consulting engineers, and Messrs. Mackay and Schellmann, consulting geologists.

The report and accounts were adopted.

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CHAIRMAN'S STATEMENT: ANGLO AMERICAN CORPORATION OF SOUTH AFRICA LIMITED

(Incorporated in the Union of South Africa)

Anglo American Corporation's Year of Widespread Activity

SIX GROUP MINES NOW IN PRODUCTION IN O.F.S. GOLDFIELD
SALISBURY OFFICE ENLARGED TO ADMINISTER INCREASED RHODESIAN INTERESTS
GROUP'S INITIATIVE IN SECURING AGREEMENT ON AFRICAN ADVANCEMENT

The following are extracts from the Statement by the Chairman, **Sir Ernest Oppenheimer,** which has been circulated to members :—

The measure of the prosperity in most of the fields of our activity is to be seen in the substantial increase in the revenues and profits of the Corporation. There was an increase in profit of £953,056. General Reserve now stands at £21,000,000.

NEW GOLD MINES

During 1955 three new gold mines in the Orange Free State in which the Corporation has substantial direct and indirect interests declared their maiden dividends. Now that the six established mines administered by the Corporation and other mines in which we are interested, in the new goldfield, are in production, it is to be expected that the revenue accruing from the Corporation's interests in the Orange Free State will increase.

Similarly, in the Far West Rand and Klerksdorp areas the Corporation's very considerable interests are rapidly becoming revenue producing, and the formal opening on June 2 of the gold and uranium producer, Vaal Reefs Exploration and Mining Company Limited marked for this Group the completion of a programme unparalleled in the history of gold mining.

Our Minister of Finance announced in his recent Budget some relaxation of the taxation of the gold mining industry, the relief granted being estimated at £700,000. We in the industry are grateful for this recognition by the Minister of the desirability of reducing the onerous burdens of tax payments the industry carries; and we believe there is a case for further consideration of this question. This might well bring benefits through the stimulus it would give to overseas investment in South Africa.

In another direction too our political leaders in this country have the opportunity of stimulating the progress and prosperity of South Africa. The extraordinarily favourable general conditions for the investment of capital in South African enterprises and in new ventures could be enhanced beyond measure by a phase of more conciliatory and more moderate political and racial policies. These would bring immeasurable benefits both in internal pacification and in external respect and approval.

For us in the gold mining industry there is much scope for action. Economy, efficiency, increasing mechanization must continue to be our aims. But we must also recognize that gold mining is, in these days, only one of several competitors for capital, for equipment, for manpower.

This competition demands that we should do much more than we have done in the past to publicize gold mining activities; to make known to potential investors the basic values of the industry; to impress the young men of South Africa with the opportunities that mining offers as a career. The full, frank and frequent disclosure of operating results, which has been standard for this industry for many years, is no longer enough. We must actively and positively seek public understanding and public trust.

Among the more noteworthy activities of 1955 were: the bringing to production of two developing gold mines, Loraine and Free State Geduld, the putting into effect of schemes for providing additional ventilation and an expansion of production at several of the producing mines in the Orange Free State; remarkable progress in the preparation of the Vaal Reefs mine for production; gigantic surface excavations in preparation for opencast operations at the Nchanga copper mine in Northern Rhodesia; continuation of preparations for the production of copper at the new Bancroft mine in Northern Rhodesia; the expanded production of the collieries and the improvement of the town at Wankie in Southern Rhodesia.

One of the most important developments in the history of the Corporation has been the decision to expand our office in Salisbury in Southern Rhodesia. In the ten years after the end of the Second World War the Rhodesian interests of the Corporation rapidly assumed increasing importance, and when the transfer of the registered offices of the principal Northern Rhodesian companies of the Group from London to the Federation took place in 1954, our thoughts turned to the advantages of establishing more direct administrative machinery, with ancillary technical services, close to, or on, the Copperbelt. Almost at the same time the final decision to establish the Federation of the Rhodesias and Nyasaland was taken.

To the considerations that were prompting us towards some measure of administrative decentralization from Johannesburg were now added the compelling thoughts that we should not be content with exploring the mineral and other business possibilities of the Federation at second-hand or by remote control. Accordingly at the end of the year some 45 members of our Johannesburg staff moved to Salisbury where an office with a resident director was already established.

LINKS WITH THE FEDERATION

Something more should, perhaps, be said about this Corporation's links with the Federation. Circumstances have established strong ties between this Group and the territories that Cecil John Rhodes brought into the Commonwealth. An inherited tradition almost demands that the Corporation, which has dominant interests in Rhodes's company, De Beers Consolidated Mines, should continue his policy of fostering the development and settlement of the Rhodesias. Besides, it is good business. Our early enterprise has drawn, and continues to draw, highly satisfactory rewards from Northern Rhodesia.

In June, 1955, a new company, Anglo American Rhodesian Development Corporation Limited, was formed to be the agency through which the Corporation and its associated companies could assist in the financing of public services in the Federation. The most practical assistance that this company could give obviously lay in the sphere of railway transport; and our own interests in the Copperbelt and at Wankie would be served at the same time.

After negotiations with the Rhodesia Railways, an agreement was reached whereby the company undertook to purchase trucks to the value of £5,000,000 and to hire them to the railways for 25 years. In addition the new company has taken over responsibility for the £1,000,000 loan that had already been made to the railways by Rhodesian Anglo American Limited.

Towards the end of 1955, with the Kariba power project beginning to take practical shape, the question of how this and other urgent schemes were to be financed had to be determined. We decided that our Group's business interests, combined with the general policy we have adopted of using some of the Group's resources in promoting the development of the Federation, justified our offering to lend the Federal Government large funds for both power and transport projects, and, in the result, Rhokana Corporation and Nchanga Consolidated Copper Mines, together with two companies of the Rhodesian Selection Trust Group, whose interests in Northern Rhodesia run so closely parallel with our own, have agreed to make loans totalling £20,000,000. In addition, all the Copperbelt producing mines will, in due course, accept a surcharge on power from Kariba until a total of £10,000,000 has accrued from this surcharge to the Kariba authority.

HUMAN RELATIONSHIPS

We are, of course, vitally interested also in the human and political relationships developing so rapidly in the new Federation. One of these matters is the general subject of what has become known as African advancement.

When we first considered this complex problem, we came to the conclusion that the path of progress lay in the direction of trying patiently to persuade our European employees to co-operate in working out a practical scheme for giving African employees opportunities for more responsible work. We believed that to attempt any form of compulsion would invite a long and angry struggle, with an aftermath, whatever the result, of untold bitterness.

Accordingly we gave our European employees assurances

that we would do nothing except with their agreement and co-operation; and we repeated these assurances at intervals throughout the long negotiations during which we constantly and deliberately chose the way of persuasion and avoided anything that might savour of compulsion. It was these assurances and the final recognition by the European Mineworkers' Union that we had no intention to force the issue that led to a calm and ultimately successful discussion of a plan for introducing African advancement. An agreement between this Group and the Union was signed in July last year; and subsequently it was, with minor modification, extended to cover the whole Copperbelt industry.

The Board of Trade has for disposal about 611 long tons AUSTRALIAN RUTILE SAND (minimum 95% TiO_2) packed in bags; lying in store in North Wales.

Any material, the subject of this offer, purchased from the Board must not be re-exported from the United Kingdom but must be consumed in the United Kingdom and not elsewhere.

Full particulars and forms of tender (returnable by 3rd July, 1956) may be obtained on application to the Board of Trade, C. & G. 8 (B), Room 317, Lacon House, Theobalds Road, London, W.C.1 (Telephone Chancery 4411, Ext.: 329/330).

PRINCIPAL TRAINING OFFICER—A Vacancy exists with Kilembe Mines Limited, for the position of Principal Training Officer at the Mines Training School, Uganda. Candidates should possess the necessary qualifications to develop existing training schemes and promote further training schemes. Previous experience of introducing and developing training schemes on a Mine preferred, but sound practical experience of industrial training will be considered. The majority of training schemes will be for African trainees. Although a fully qualified T.W.I. Trainer would be preferred, applications from experienced Teachers and Educationalists would be considered. The duties of the Principal Training Officer includes the training of a staff of African Instructors in the Job Instruction Method. He would also be required to guide the training of African Instructors and Trainer Operators in the plant, through an Assistant Training Officer. Salary is on the scale £1,500 - £1,800 per annum. Three year Contract with paid passages will be entered into. The vacancy offers a unique opportunity for the right man. Applicants should be in a position to assume duties at an early date. Apply with full details of personal data, qualifications, practical experience, previous employment and copies of references to the General Manager, Kilembe Mines Limited, P.O. Box 1, Kilembe, Uganda, East Africa.

BURMA MINES LIMITED

The following summarises the Operating results of **BURMA CORPORATION (1951) LIMITED** (Incorporated in the Union of Burma and jointly owned by Burma Mines Limited and the Union Government) for the NINE months ended 31st March, 1956.

ORE EXTRACTION

Quarter ended 30th September, 1955	29,394 tons
Quarter ended 31st December, 1955	28,359 tons
Quarter ended 31st March, 1956	26,095 tons
	83,848 tons

PRODUCTION

Quarter Ended	*Concentrating Ore Milled (dry tons)*	*Ozs. Silver*	ASSAYS *% Lead*	*% Zinc*
30th September, 1955	29,151	14.87	17.79	11.88
31st December, 1955	30,190	14.12	17.50	10.92
31st March, 1956	26,067	13.18	16.76	10.65

Marketable products were as follows :—

Quarter Ended	*Refined Lead Tons*	*Refined Antimonial Lead Tons*	*Refined and Doré Silver Fine Ozs.*	*Copper Matte Tons*	*Nickel Speiss Tons*	*Zinc Concentrates 56%-58% Zn. Dry Tons*
30th September, 1955	3,942	85	348,236	66	14	4,035
31st December, 1955	4,189	151	389,909	143	110	3,708
31st March, 1956	3,812	166	347,528	91	203	2,949
	11,943	402	1,085,673	300	327	10,692

ESTIMATED REVENUE AND EXPENDITURE

	Quarter Ended 30.9.55	*Quarter Ended* 31.12.55	*Quarter Ended* 31.3.56	*Total for 9 months ended* 31.3.56
Gross Revenue (after adjustment of value of Metal Stocks)	K.1,04,50,400 (£783,780)	K.1,03,41,900 (£775,642)	K. 94,98,000 (£712,350)	K.3,02,90,300 (£2,271,772)
Operating Expenditure	K. 58,74,500 (£440,588)	K. 59,60,100 (£447,007)	K. 63,32,000 (£474,900)	K.1,81,66,600 (£1,362,495)
Operating Profit	K. 45,75,900 (£343,192)	K. 43,81,800 (£328,635)	K. 31,66,000 (£237,450)	K.1,21,23,700 (£909,277)
Taxation	K. 24,92,000 (£186,900)	K. 23,58,000 (£176,850)	K. 16,59,000 (£124,425)	K. 65,09,000 (£488,175)
Depreciation	K. 1,73,700 (£13,027)	K. 1,83,700 (£13,777)	K. 2,05,800 (£15,436)	K. 5,63,200 (£42,240)
Capital Expenditure	K. 2,43,700 (£18,277)	K. 2,16,400 (£16,230)	K. 3,88,500 (£29,138)	K. 8,48,600 (£63,645)

The estimated excess of revenue over expenditure for the Quarter to March 31st 1956 is lower than that for the previous Quarter mainly due, apart from increased expenditure, to heavier forward sales of pig lead in the earlier period with consequent reduction of tonnage for sale in the following period.

After deducting the foregoing estimates for Taxation and Depreciation the estimated Net Profit for the NINE months is K.50,51,500 (£378,862).

The Sterling figures shown are based on a Rate of Exchange of 1/6d. per Kyat.

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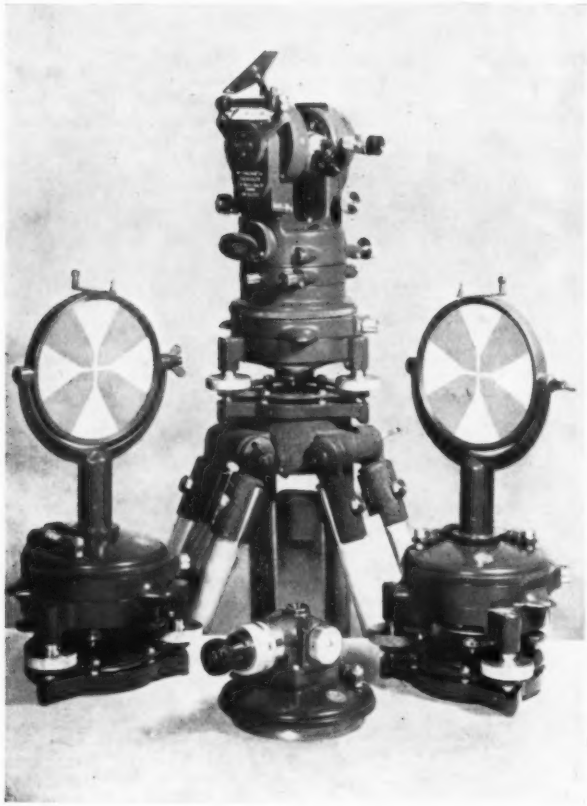

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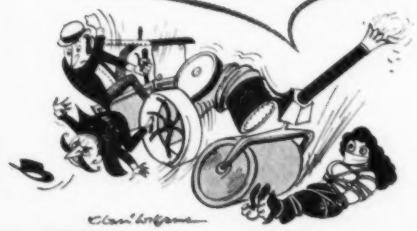

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CENTRAL PROVINCES MANGANESE ORE COMPANY, LTD.

CURRENT LEVEL OF DEMAND SATISFACTORY

ACTIVITIES HAMPERED BY SHORTAGE OF RAIL TRANSPORT

MR. H. R. HOLMES ON DIAMOND DRILLING PROGRAMME

The 48th Annual General Meeting of the Central Provinces Manganese Ore Company, Limited, was held on Tuesday last at Winchester House, Old Broad Street, London, E.C.2, **Mr. H. R. Holmes** (Chairman) presiding

Mr. T. D. de Deney, A.C.I.S. (Secretary) read the notice convening the meeting and the auditors' report.

The Chairman said :—Ladies and Gentlemen,

The Report and Accounts for the year ended December 31, 1955, have been in your hands for some time, and I propose, with your permission, to take them as read. (Agreed.)

Before dealing with these accounts, I want to refer to changes in the Board of Directors. As you may know I have held the office of Managing Director of the Company for the past 33 years, and have also been Chairman since 1944. I felt that the time had come for the office of Managing Director to be in younger hands, consequently I resigned that office with effect from the end of February of this year, and Mr. A. Linton and Mr. W. A. Hardy have been appointed Joint Managing Directors in my stead. I shall, however, continue to act as Chairman of the Company, for the present at any rate.

Mr. Linton and Mr. Hardy have both been connected with the Company for over 30 years, Mr. Linton first as Secretary and then as Secretary and Director, and Mr. Hardy first as Mine Manager, then as General Manager in India, while in 1954 he joined the Board in London. In my judgment the wide and varied experience of these two gentlemen will be of great value to our Company in their new office. Mr. T. D. de Deney, who has been with the Company since 1916, has been appointed Secretary.

The past year has not been an easy one, and you will see from the Profit and Loss Account that the Balance on Trading was down from £2,234,297 to £1,673,038. This was due to the deterioration in the railing facilities in India, which prevented us from implementing our contracts in full. In addition, the prices obtainable in 1955 were lower than those in 1954 as was foreshadowed in the report for that year. I am glad to say that higher prices are being obtained in the current year and that the demand for our ore is at present good and should continue to be so in view of the increased world production of steel, but so far as this Company is concerned, the question of railings is of vital importance, and unfortunately these still remain unsatisfactory owing to the general demand in India for traffic facilities. This is a matter that engages our constant attention and is the subject of frequent representations to the Authorities concerned. However, should more wagons be made available to us, and provided nothing unforeseen arises, I think that the prospects for the current year's trading are reasonably satisfactory, though we are faced with rising costs including wages, royalty and railway freight.

YEAR'S RESULTS

Of the Balance on Trading Account, taxation takes £931,000 most of which consists of Indian Taxes. On the Debit side of the Profit and Loss Account, Depreciation of Fixed Assets amounts to £129,428 against £97,251, and this, of course, is owing to the substantial expenditure we have made in recent years on Plant, Machinery and Buildings. This expenditure has been very much worth while, and has resulted in the more efficient working of the Mines. The Net Profit for the year, after providing for Taxation and Depreciation is £646,153 as against £899,284 for the previous year. After adding the £100,000 transferred from Taxation Reserve Account and after making the customary Provident Fund deduction, your Directors recommend that the sum of £150,000 be transferred to the General Reserve which will increase it to £500,000. I feel sure that you will appreciate the prudence of this allocation, which is consistent with our policy of providing from our own reserves the considerable sums necessary for our mechanization programme. Your Directors also recommend that the following appropriations should be made :—

To Staff Benefit Fund	£20,000
To Workers' Welfare Fund	£20,000

The latter contribution is to enable us to continue to make provision for amenities for our labour and to improve the conditions under which they work and live. I am glad to inform you that our relations with the Trade Union and labour generally continue to be satisfactory.

An Interim Dividend of 1/2d. per unit free of tax was paid on October 1 last, and your Directors now recommend that a Final Dividend of 1/8d. per unit, plus a bonus of 8d. per unit, both free of tax, should be paid, altogether absorbing £525,000. This will leave £257,130 to be carried forward, as compared with £228,790 brought in.

THE BALANCE SHEET

Turning to the Balance Sheet, you will notice on the Assets side that the Leases over Manganese Properties in India stand at £137,557 as compared with £194,574 in the previous year. This is on account of our having disposed during the year of our Bonai Mines which we purchased in 1941.

Regarding our leases generally the term for which they are granted expires at various dates between the years 1961 and 1963, but all these leases contain a Renewal Clause.

Under Current Assets, the stock of Manganese Ore amounted to £1,027,327 against £835,681 and this is an indication of the lack of railing facilities to which I have referred earlier.

VISIT TO THE MINES

In January of this year Mr. Hardy visited the mines in India when he made a thorough inspection of the properties, and submitted full and informative reports to the Board. I am pleased to say that he found the Mines in good condition.

He took the opportunity of calling on certain Central Government officials in Delhi, and also State Government Ministers and officials in Nagpur. I am glad to say that our relations with these different Authorities continue on a satisfactory basis.

With regard to the Heavy Media Separation Plant, the initial difficulties to which I referred last year have been overcome and a considerable tonnage of ore of good quality has been produced during the year.

DIAMOND DRILLING PROGRAMME

Our Diamond Drilling Programme continues, and drills have been working at Tirodi, Munsar, Gumgaon and Ukwa Mines. Two holes sunk recently at Ukwa Mine indicate that there may be a very considerable tonnage of ore of very good quality in this property at comparatively shallow depth, and drilling is continuing there. Drilling at the other mines has been undertaken to prove the beds in depth in connection with our opencast operations at these properties.

The Government Electricity grid supply will reach our Tirodi and Balaghat Mines within three months or so, and all the electrical plant and equipment has been purchased and much of it will be ready for operation as soon as the supply is available. At our South Tirodi Mine a crushing and conveying plant is being installed for the raising of overburden which will considerably ease the long haul for our heavy vehicles. At Balaghat Mine a new five compartment shaft is being sunk which will raise ore from Nos. 3, 4 and 5 levels. Nos. 1 and 2 levels are being worked from two smaller shafts, which are now being provided with two electric hoists in place of the old steam equipment. Adequate electric pumps and air compressors are being provided for the mine which should be in a position to give considerably greater outputs of excellent quality ore as soon as this programme has been completed.

From what I have told you I feel sure that you will appreciate that our Mines are in good condition, that we can produce the ore, and that we can sell it; but that at the present moment our activities are hampered owing to the shortage of railway transport from the Mines to the Indian ports. We must hope that in due course this difficulty will be surmounted.

Again I have pleasure in acknowledging the excellent work of the staff, both in India and in London, and also of the work of our Shipping agents in India, Messrs. James Finlay and Co. Ltd., who have been most efficient and helpful.

I now beg to move :—" That the report of the Directors and Statement of Accounts as at December 31, 1955, be and are hereby approved and adopted, and that the profits be appropriated as recommended by the Directors ". I will ask Major Herring to second the motion, and before putting it to the Meeting I shall be glad to deal with any questions which Stockholders may wish to ask.

Major A. C. Herring, V.C., A.C.A., seconded the resolution which was carried unanimously.

The Board's proposal of a final dividend of 1s./8d. per unit, free of tax, and a bonus of 8d. per unit, free of tax, was also approved.

The retiring director, Mr. H. R. Holmes, was re-elected and the remuneration of the auditors, Messrs. W. A. Browne and Co., having been fixed, the proceedings terminated with a vote of thanks to the chairman, directors and staff, both at home and abroad.

BRITISH GUIANA CONSOLIDATED GOLDFIELDS

OPERATING PROFIT MAINTAINED

The 20th annual general meeting of British Guiana Consolidated Goldfields Limited was held on June 11 in London.

Sir Roland Robinson, M.P. (the chairman), in the course of his speech, said :—

The Profit and Loss account for 1955 discloses an operating profit of £65,067, approximately the same as for 1954. While the yardage dredged during 1955 by the Potaro dredge compares favourably with that of the previous year, the production from the Mahdia dredge was small, its contribution being just over 3% of the production for the year, as it was only operating for four months, and although the whole ground dredged produced 4.6 grains fine of gold per cubic yard compared with 4.3 grains fine last year, the total yardage has dropped by 370,000 cu. yds., with the result that the revenue for the year has decreased by £25,000. This decrease in revenue is offset by a similar decrease in operating expenses, largely of course accounted for by the fact that operations in the Mahdia area were only carried on for four months of the year.

As previously, we have had to meet out of our profits not only the interest on the first debenture, but interest on the monies loaned under the second debenture, and as a matter of interest I might mention that since the first borrowing on the second debenture, we have, up to December 31, 1955, paid £67,000 interest in this connection. It is interesting to know that your Company has been able to meet such heavy charges.

After deducting the tax required to be provided, and crediting £7,500 of taxation provision in earlier years no longer required, there is £12,594 available, from which your Directors have recommended that a dividend of 5% less tax at 8s. 6d. in the £, should be paid.

Every year I have commented on the increasing difficulties of transport in the Colony. During 1955 I regret to say, air transport facilities deteriorated. As a result your Directors came to the conclusion that every effort must be made to improve rail and river communications, and it was therefore decided to acquire the operating rights over the Rockstone-Wismar railway together with the locomotive and equipment in use on this track. Reconditioning of the equipment has been undertaken and I am glad to say that under the able supervision of our General Manager, Mr. Park, the company has benefited by this acquisition.

The progress of the hydro-electric installation, which our subsidiary, the Potaro Hydro-Electric Co. Ltd. is erecting on the Potaro River, has been much slower than we anticipated when I addressed you last year. Although a good deal of progress has been made, we have not had the good fortune to experience the expected dry spells which according to past records, we might justifiably have anticipated. As a result we have had to contend with repeated and unexpected periods of flood water, which submerged the works and necessitated valuable time being spent on checking, after the floods had receded, that no substantial damage had been caused. The contractors have also experienced a good deal of trouble in obtaining satisfactory labour for the construction work.

Our experts advise us that it will now be late autumn of this year before we can hope to obtain hydro-electric power from the installation which, in turn means that the Konawaruk dredge cannot be completed and put into operation until towards the end of this year.

These delays to which I have referred and which affect the starting of the Konawaruk dredge production, are having and will continue to have for some time an adverse effect on the company's resources, as it means that there will be a gap of at least a year and a half between the cessation of operatics by the Waddington dredge and the commencement of operations by the Konawaruk dredge, but once the company is on a two-dredge production basis again, our ability to work profitably will be greatly enhanced.

It is now just 20 years since your company started gold dredging operations in the Colony, and it may not always be realized what has been achieved by this comparatively small company in that period, during which the Waddington dredge on the Mahdia river was the company's only dredging unit for approximately three quarters of that time. The total yardage dredged during the 20 year period was 22,714,967 and the gold won amounted to 190,623 fine ounces, which sold for BG$9,384,000. During the period over 80% of that amount, viz. BG$7,500,000, including $840,000 by way of taxation, was spent in the Colony, no small contribution to the Colony's economy.

Figures for the Potaro dredge for the five months to 31-5-56 are as follows:— Yardage dredged, 655,531; Fine ounces recovered, 6,972.

The report was adopted.

ROSE DEEP, LIMITED

REDUCTION OF CAPITAL

At the Ordinary General Meeting of the Company held in Johannesburg on May 7, 1956, a Special Resolution was passed providing for the reduction of the capital of the Company to £402,500 in 700,000 shares of 11s. 6d. each and the return to shareholders of 2s. 6d. per share in cash. This has now been confirmed by an Order of the Supreme Court of the Union of South Africa, which will be registered on June 30, 1956, whereupon the reduction will immediately become effective.

The repayment of 2s. 6d. per share will be made to shareholders who are registered in the books of the Company at the close of business of June 30, 1956, and to persons presenting Share Warrants to Bearer in circulation on that date.

The return of capital is payable in South African currency and becomes due on July 2, 1956.

Payment from this office will be in British currency at par, provided that should there be any difference that may be regarded by the Board as material between the two currencies on July 2, 1956, payment will be made on the basis of the equivalent British currency calculated at the rate of exchange ruling on that date.

Cheques in payment will be posted on or about August 8, 1956, to shareholders at their registered addresses or in accordance with their written instructions.

Cheques will be despatched from the Registered Office, Johannesburg, to addresses in Africa, south of the Equator, and from the Office of the London Secretaries to addresses elsewhere. Unless instructions, which will necessitate an alteration in the Office from which payment is to be made, are accepted by the Company on or before June 30, 1956, payment will be made in accordance with existing instructions.

The Transfer Books and Register of Members will be closed from July 1 to July 7, 1956, both days inclusive.

Holders of Share Warrants to Bearer in circulation at June 30, 1956, must deposit their warrants through an Authorised Depositary on their behalf, duly listed on the proper forms, on or after that date at the Office of the London Secretaries, 4 London Wall Buildings, London, E.C.2, or they may deposit their warrants at the Crédit Lyonnais, 19 Boulevard des Italiens, Paris, in order that the return of 2s. 6d. per share may be made on the shares included therein, and that the warrants may be impressed with a note of the reduction in the capital. Share Warrants to Bearer should be presented on or before August 2, 1956, so that payment may be made on the date fixed for payment to registered shareholders. Amounts payable in respect of Share Warrants to Bearer will be on the currency basis detailed above, irrespective of the date on which the warrants are presented.

Forms for listing Share Warrants to Bearer may be had on application.

Share Warrants to Bearer sent to either of the above addresses by post or other means of transport and any that are required by the depositors to be returned to them by such means, will be at the risk of the proprietors during transit, and the Company cannot accept any responsibility for their loss in transmission.

4 London Wall Buildings,
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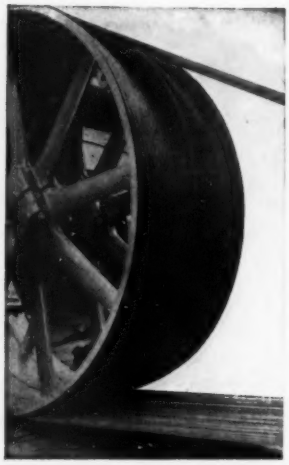

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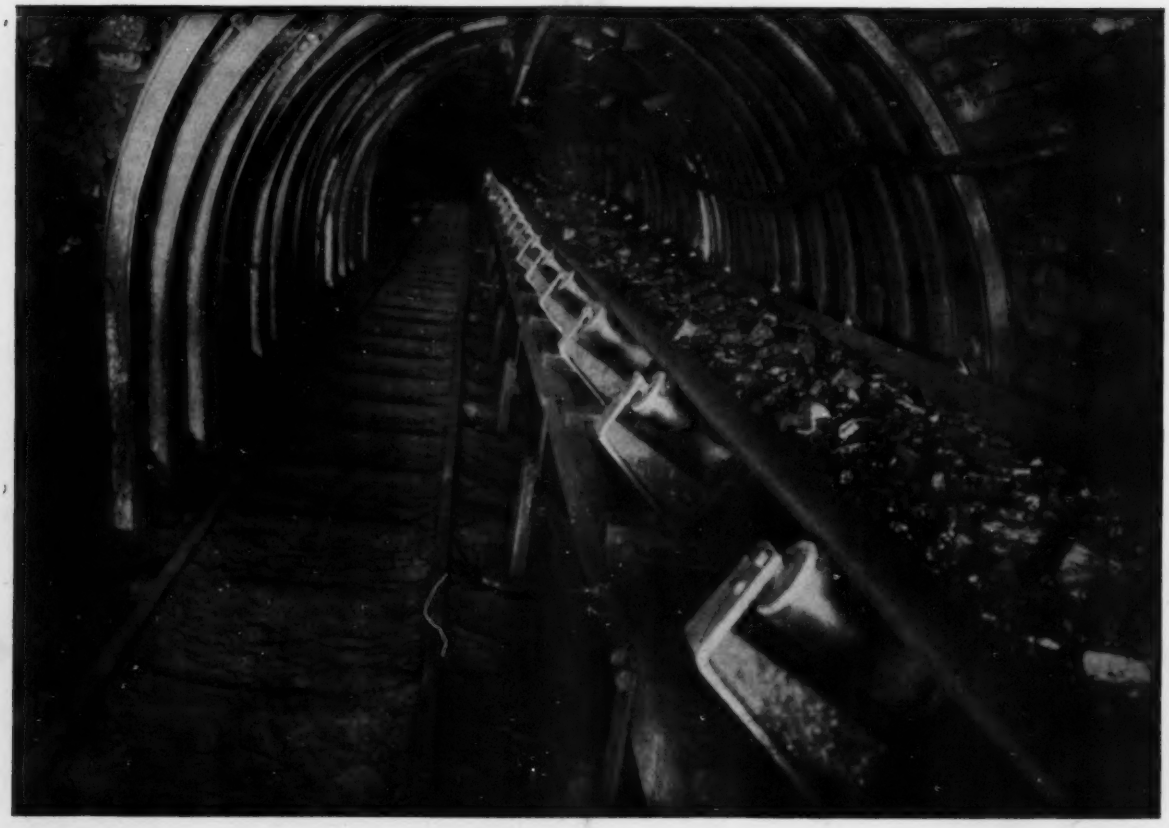

The large trunk conveyor shown above illustrates both good theory and good practice. It is built up of open structure to facilitate inspection. The structure is raised to keep the return belt clear of the floor. It is fitted throughout with Huwood Oil-filled Idler Rollers, and all belt joints are vulcanized. The conveyor is approximately 1400 yards long, is driven by a 60 h.p. G.T.B. Drive Head, the belt being 42 inches in width.

This conveyor has now carried approximately three million tons and is still in excellent condition.

HEAD OFFICE & FACTORIES: HUGH WOOD & CO., LTD., GATESHEAD-ON-TYNE, 11.
Telegrams: HUWOOD, GATESHEAD. *Telephone:* LOW FELL 76083 (5 lines).

Industrial and Export Office: DASHWOOD HOUSE, 69 OLD BROAD STREET, LONDON, E.C.2.
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